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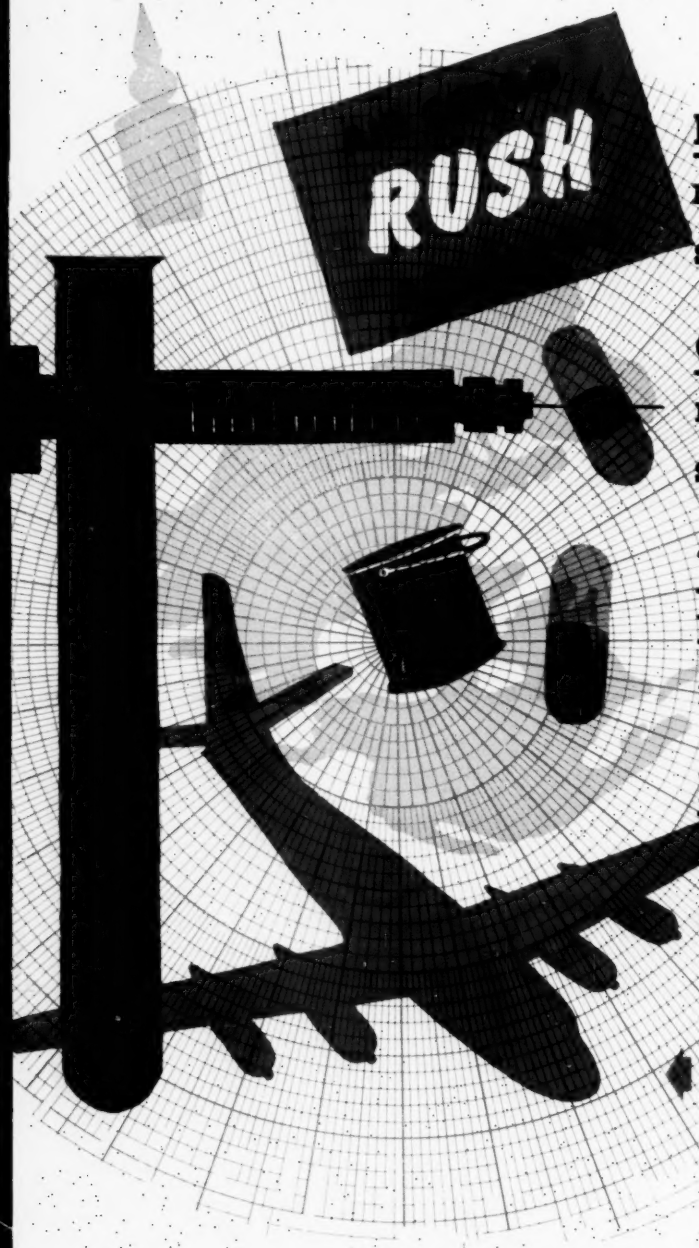
Chemical Week

August 9, 1958



Pricing of antibiotics: FTC report—with added "sting" stirs strong reaction . . p. 21

Craft barriers breached. Automation opens way for multi-skill maintenance men . p. 57

"Building block" analyzers broaden their scope, qualify for new process jobs . p. 66

Plastic pipe sales forecast: $70 million/year by '60; $200 million/year by '66 . . p. 77

Jet speed delivery could add a new dimension to your marketing concept . . . . p. 87

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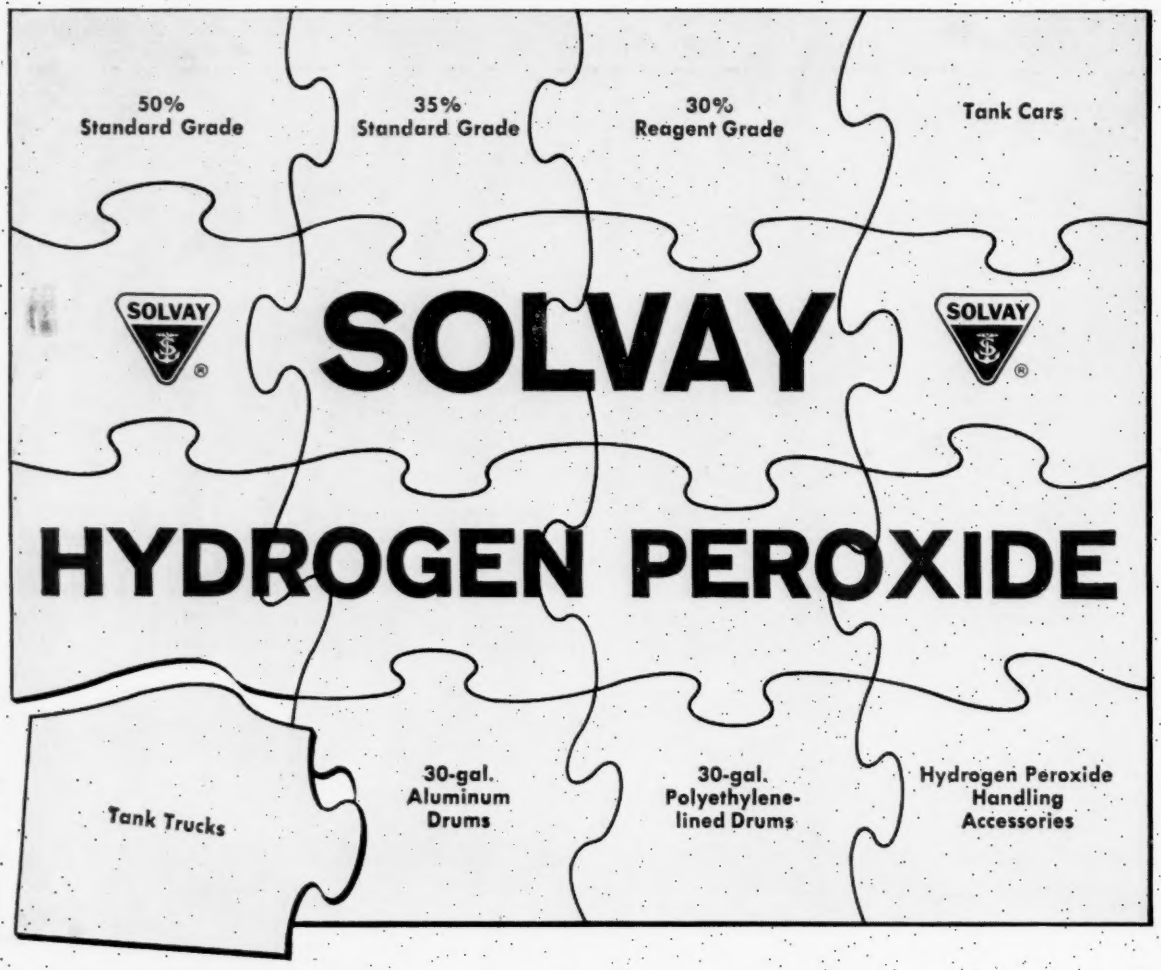

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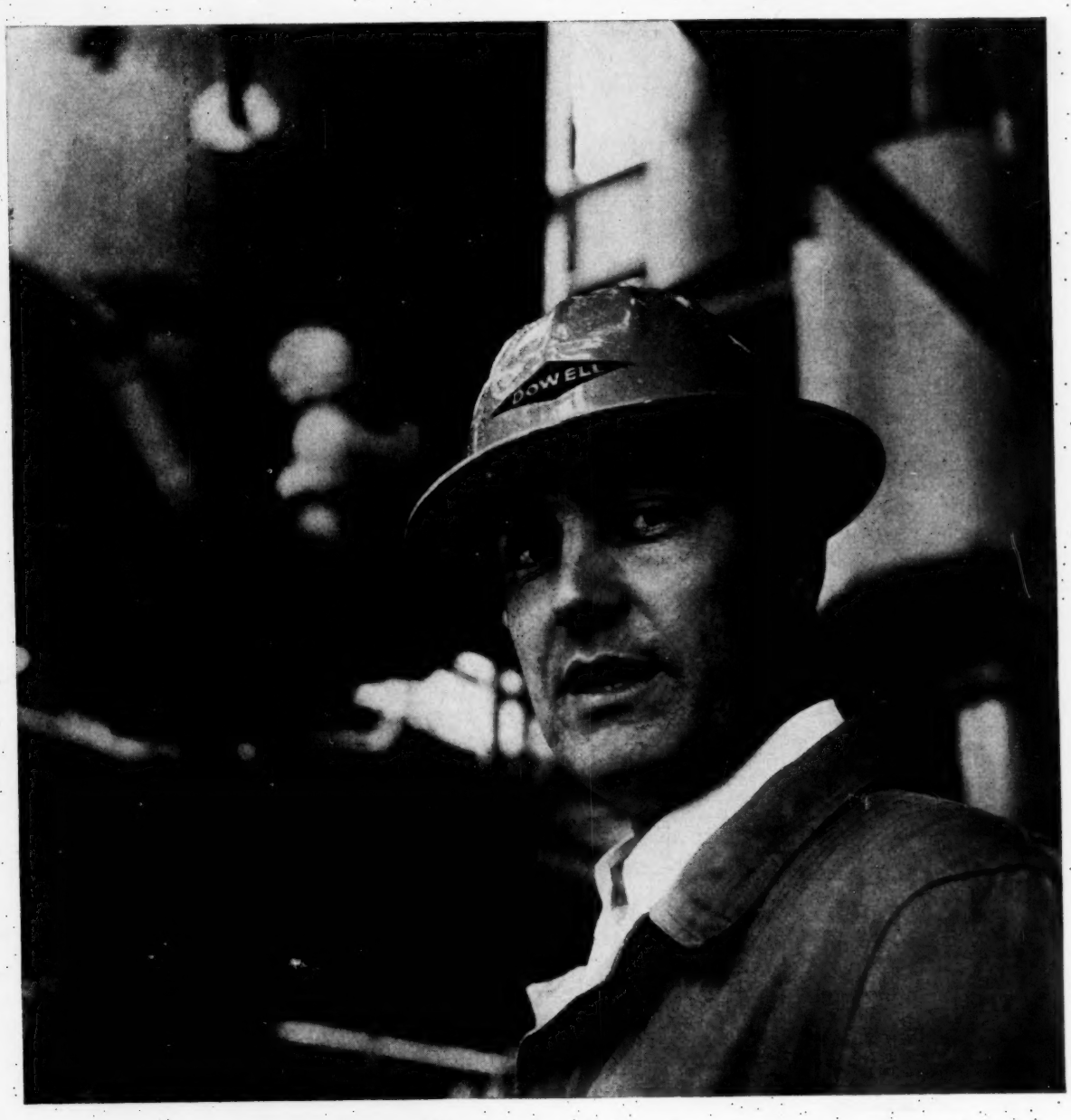

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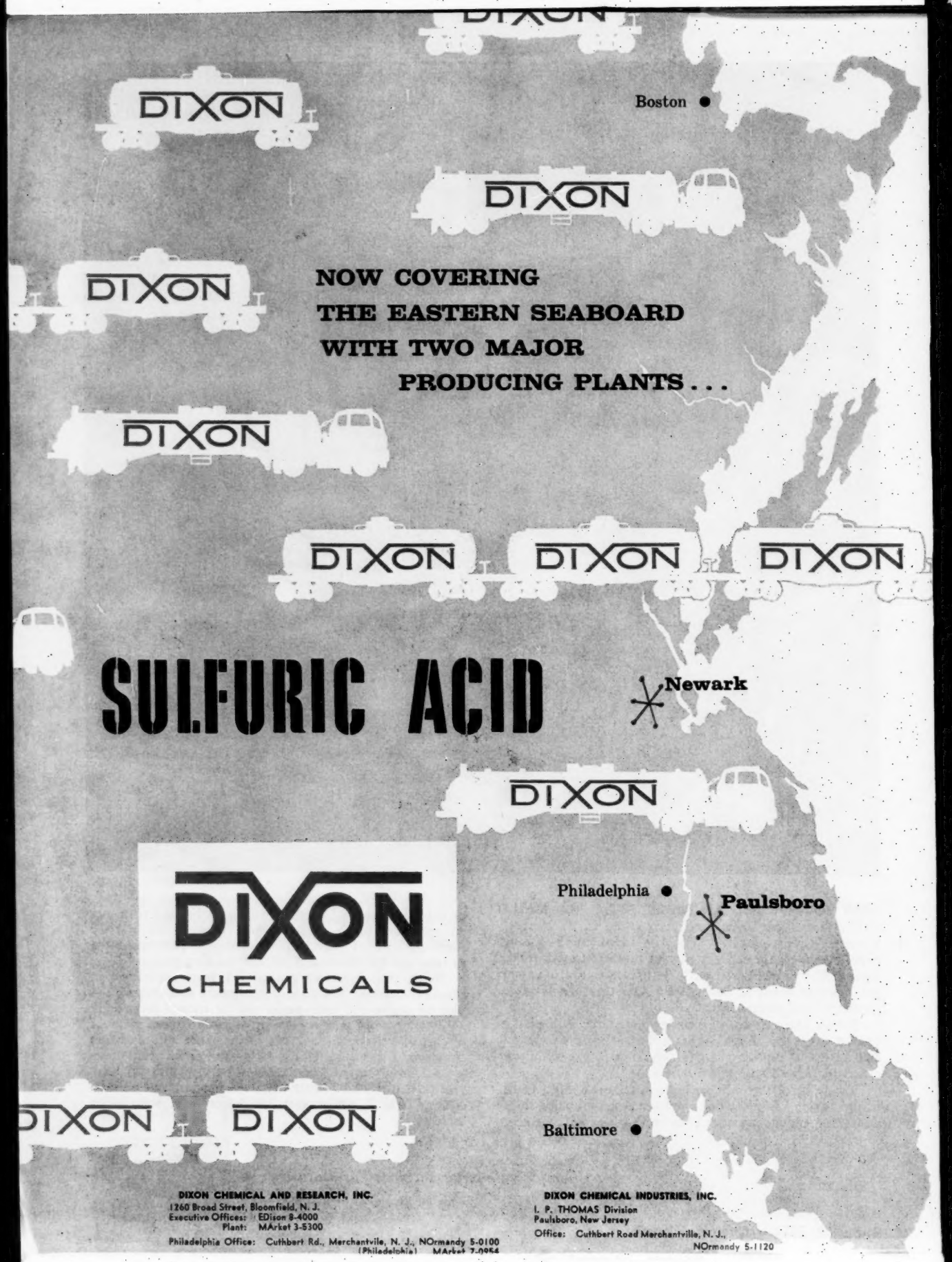
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Chemical Week

TOP OF THE WEEK

AUGUST 9, 1958

- **Earnings are climbing with second-quarter sales,** according to latest company reports ..... **p. 24**
- **Four-week science day camp**—new idea in industry-sponsored career guidance for teenagers ..... **p. 30**
- **Boom in professional pest control swells market for chemicals** to quell insects, rodents, weeds ..... **p. 45**
- **Researchers' growing concern with Russian science** brings surge in technical translations ..... **p. 92**

13 OPINION

13 VIEWPOINT
Preserve your stake in our political system; "give a buck to your party."

17 BUSINESS NEWSLETTER

21 FTC's two-year probe of antibiotic pricing and patents results in explosive report.

23 At bat for industry—three times in one week, MCA makes industry's case on legislative problems.

24 Uptrend in second-quarter sales and earnings confirmed in latest company reports.

24 Latest in phosphorus trade-secret battle: (1) final decree against employee; (2) fertilizer co-op finds a new design firm; (3) second trial set for November.

27 WASHINGTON NEWSLETTER

30 ADMINISTRATION
Wilmington, Del., chemical firms sponsor summer day camps for science-minded high school students from throughout the state.

36 There's new help for small chemical makers in government's revised program for small-business financing and labor-relations help.

36 Should operators pay tax on plants they run for the government? Chemical firms are fighting local attempts to set such levies.

40 Carborundum, encouraged by union cooperation, decides to build at Niagara Falls, N.Y., instead of in Ohio.

45 SPECIALTIES
Exterminators buy plenty of chemicals. Here's how they operate, how to sell to them.

49 Orkin—biggest company in the pest-control business.

57 PRODUCTION
Automation puts the spotlight on multiskill mechanics — here are management, union attitudes toward the "jack of many trades."

66 ENGINEERING
Technicon tailors its "building-block" analyzers for new process-control jobs.

73 TECHNOLOGY NEWSLETTER

77 MARKETS
U.S. plastic pipe sales head for $200-million/year mark by '66, but prices, building codes, product quality pose marketing problems.

83 MARKET NEWSLETTER

87 SALES
Air freight companies make strong new pitch for jet-speed delivery of products.

92 RESEARCH
Mounting concern with Russian technical literature sparks boom in translation business.

100 CHARTING BUSINESS
Cosmetic industry's packaging needs soar. Needed: 2.45 billion glass, plastic containers this year.

40,633 copies of this issue printed

Vol. 83
No. 6

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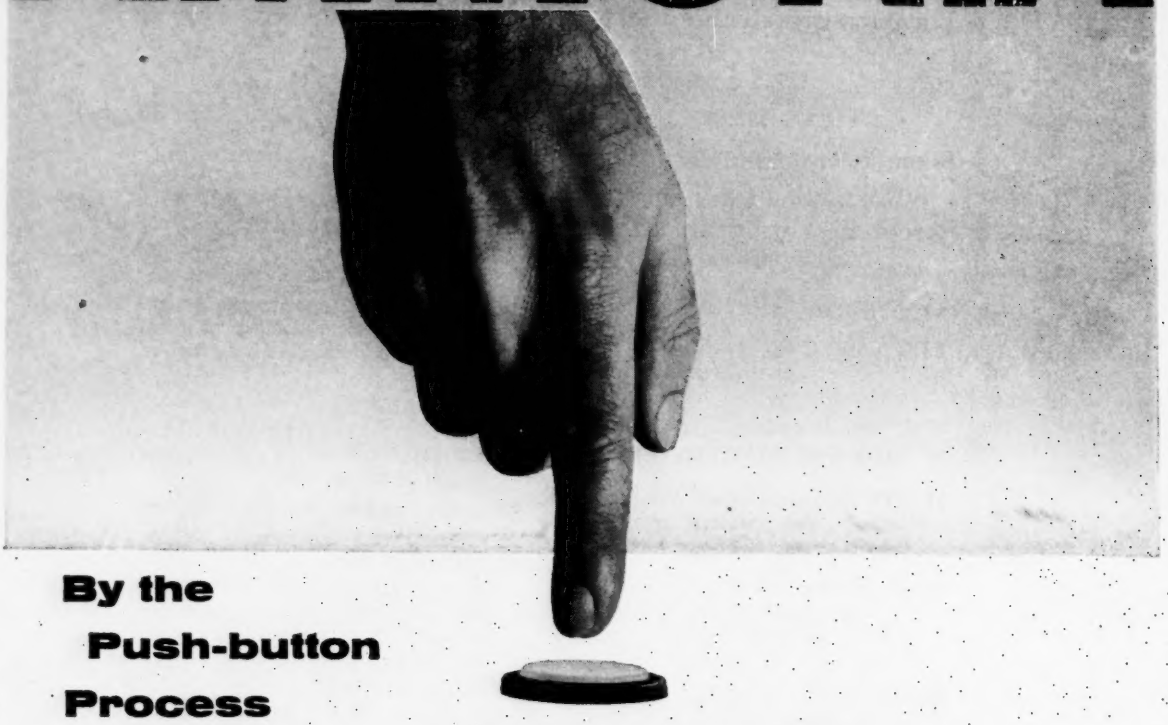

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AUGUST 9, 1958 **Vol. 83, No. 6**

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder. Executive, Editorial, Circulation and Advertising offices: McGraw-Hill Building, 330 West 42nd St., New York 36, N. Y. Publication office: 3rd & Hunting Park Ave., Philadelphia 40, Pa. See panel below for directions regarding subscriptions or change of address. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice-President; L. Keith Goodrich, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; A. R. Venetian, Vice-President and Circulation Coordinator.

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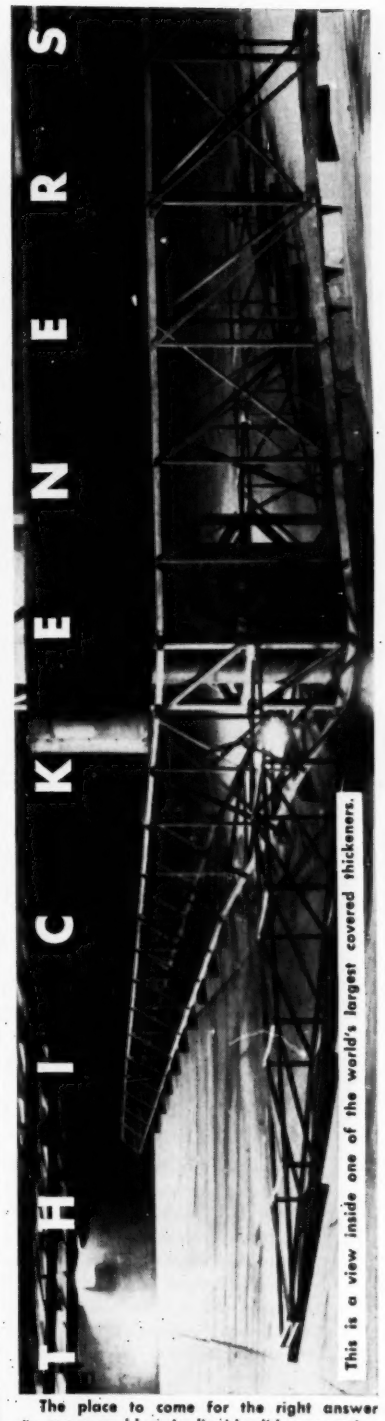

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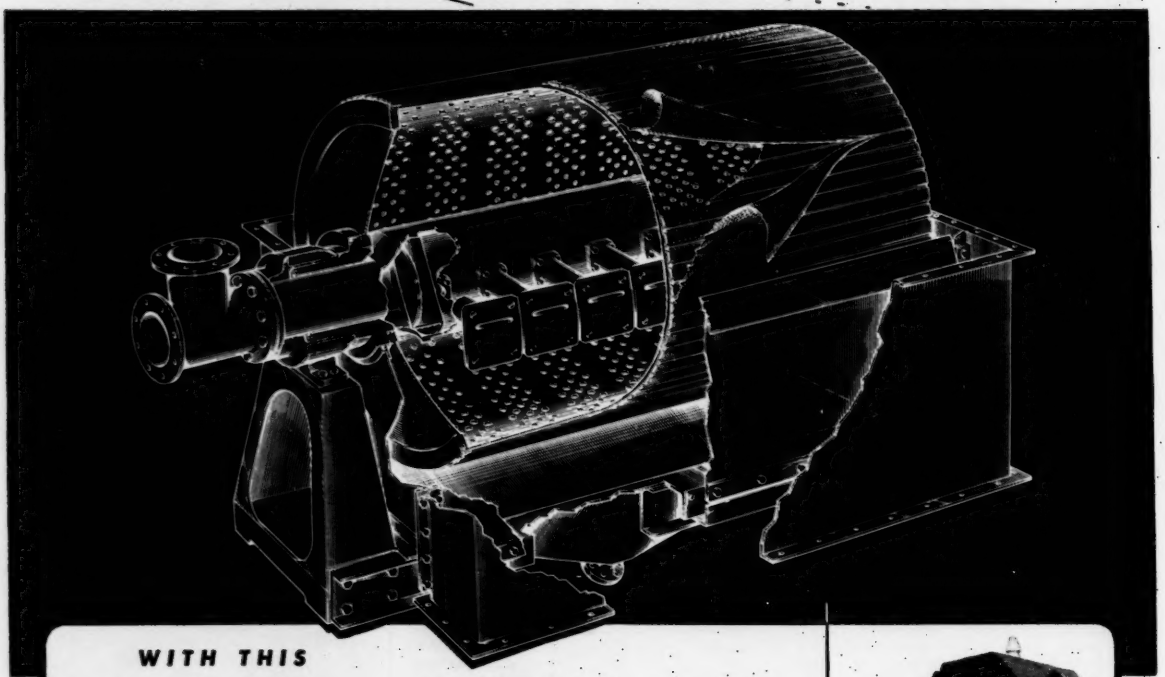

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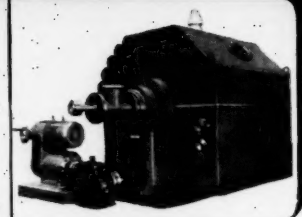

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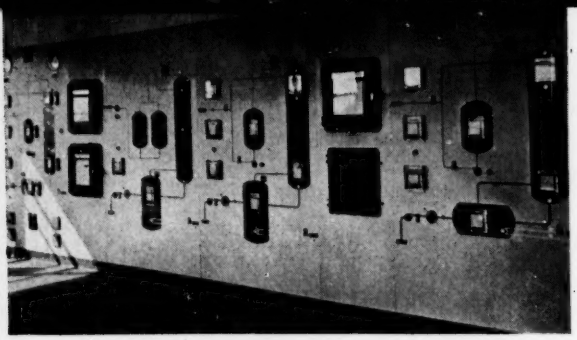

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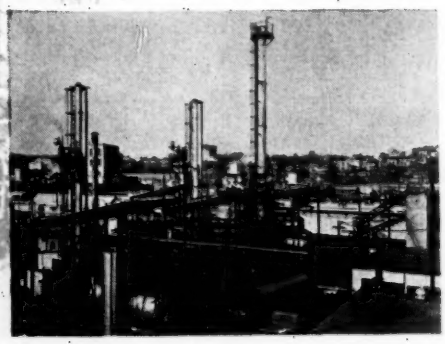

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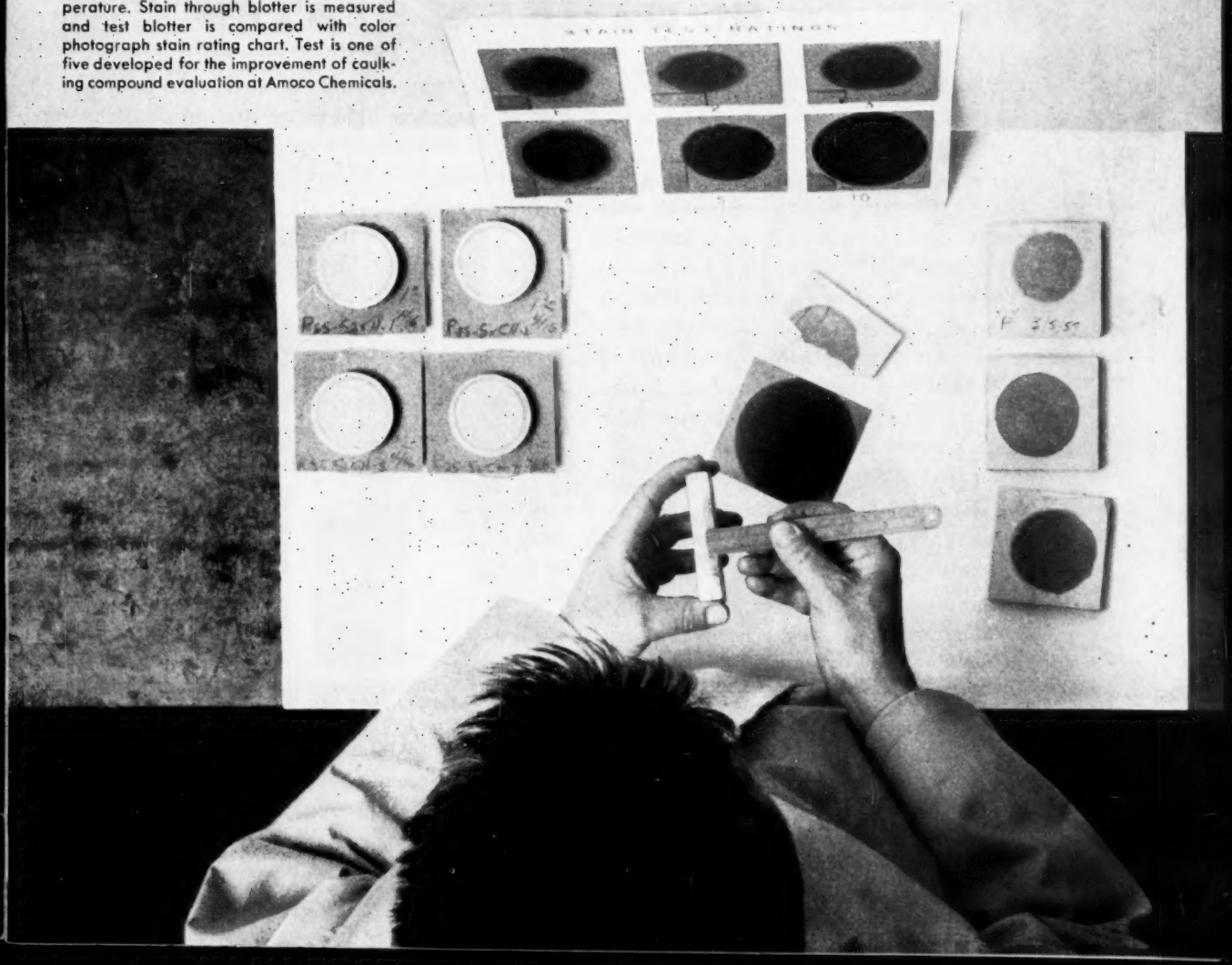

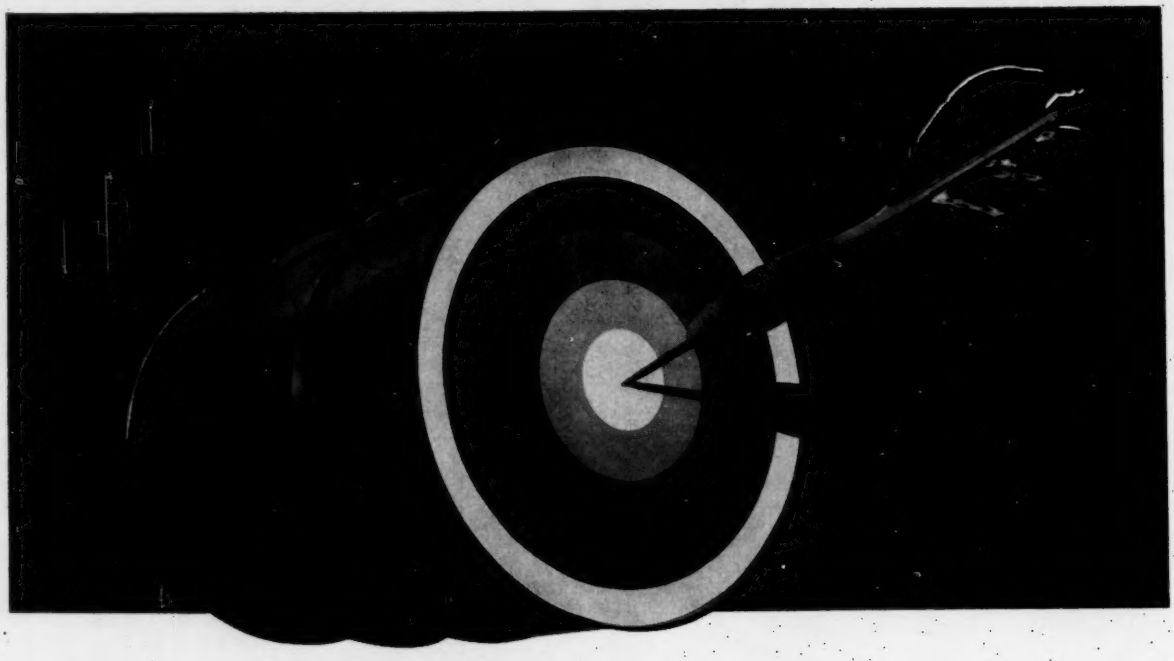

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OPINION

Wax Roster Waxes

TO THE EDITOR: Re your *CW* Report titled "Wax Shortage Ahead?" (*July 19*) . . . we are sorry to note you do not list us as Blenders and Formulators and Importers and Exporters.

As a matter of fact, you show two companies in your list—Distributing and Trading Co. Inc. (New York) and Wax Corp. of America (Brooklyn). We recently acquired the micro wax ceresin and ozokerite business from both of these companies. . . .

FRANK W. CLARKE
General Manager
International Wax Refining Co.
Valley Stream, N. Y.

Trade with China?

TO THE EDITOR: Just a note of congratulations for your comments in Viewpoint (*July 5*).

It is indeed refreshing to know an American editor has the breadth of vision to so well define the feeling of some Canadians at least on the China trade question. It's pleasant to know that your best chemical customer is having some little effect on U.S. thinking.

W. H. SILVERSIDES
Manager
Chemical & Fertilizer Dept.
Interprovincial Co-operatives Ltd.
Winnipeg, Can.

Tariffs a Fallacy?

TO THE EDITOR: There are two fallacies in your editorial of June 28. First, if, due to tariff walls, I must pay $2 for a product that can be produced abroad for 50¢, then my standard of living has been lowered, not only for the short term but also for the long term.

Second, our standard of living, as you point out, is due to our productivity. If we cannot produce more than our foreign competitors, our standard of living cannot be maintained at high level by protective tariffs. Assume that, on the average, $2 represents the wage of an American workman and 50¢ the wage of a European workman. For any American who does not produce four times as much, the $2-to-50¢ ratio can be maintained only by a protective tariff. A little thought will show that the protective tariff, like other trade barriers protecting the inefficient producer, penalizes the superior producer.

The protective tariff is only another example of the old fallacy of trying to get something for nothing. We can maintain our superior standard of living only through hard work and superior productivity.

NELSON R. ELDRED
South Charleston, W. Va.

Reader Eldred's contentions are valid, it seems to us, only if the U.S. buys but does not sell abroad. But trade implies reciprocity, and under such circumstances industry tends to build up in the areas of cheaper labor. For a domestic example, witness the migration of textile, shoe and furniture manufacturing from New England to the South.—ED.

Lost Lakes

TO THE EDITOR: I wish to call your attention to the article titled, "Water: Boon and Bane to N. E. Texas CPI" (*June 21*). . . .

Your map does not show three of the important lakes in our area. I refer to Benbrook Lake (constructed by the federal government), and Lakes Worth, Eagle Mountain and Bridgeport, constructed many years ago by local taxpayers and serving as a source of water supply for the Fort Worth metropolitan area, which has a population of 565,000. . . .

W. O. JONES
Executive Vice-President
Fort Worth Chamber of Commerce
Fort Worth, Tex.

MEETINGS

Gordon Research Conferences, series of 36 topics, Colby Junior College, New Hampton School and Kimball Union Academy, all in New Hampshire, ends Aug. 29.

Western Packaging and Materials Handling Exposition, Civic Auditorium, San Francisco, Aug. 11-13.

"Atoms for Peace," second international exhibition, Geneva, Switzerland, Sept. 1-14.

American Chemical Society, 134th national meeting, Chicago, Sept. 7-12.

DCAT, 68th annual meeting, Sagamore Hotel, Lake George, N.Y., Sept. 11-14.

VIEWPOINT

DURING THESE sultry dog days, it is pleasanter to point with pride than to view with alarm. We point with pride this week to Michael Ryan, director of advertising for Allied Chemical Corp.

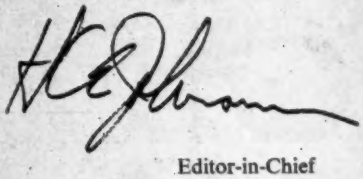
Mike Ryan, with the blessings of his company, is spending a good deal of his time this summer and fall as volunteer chairman of the American Heritage Foundation's "Give a Buck to the Party of Your Choice" campaign.

The foundation was formed 11 years ago as a nonpartisan, nonprofit educational organization. Its board of trustees is made up of eminent representatives from business, education and labor. In the past, it has sponsored such projects as The Freedom Train, Crusade for Freedom, and the "Register, Inform Yourself and Vote" campaign.

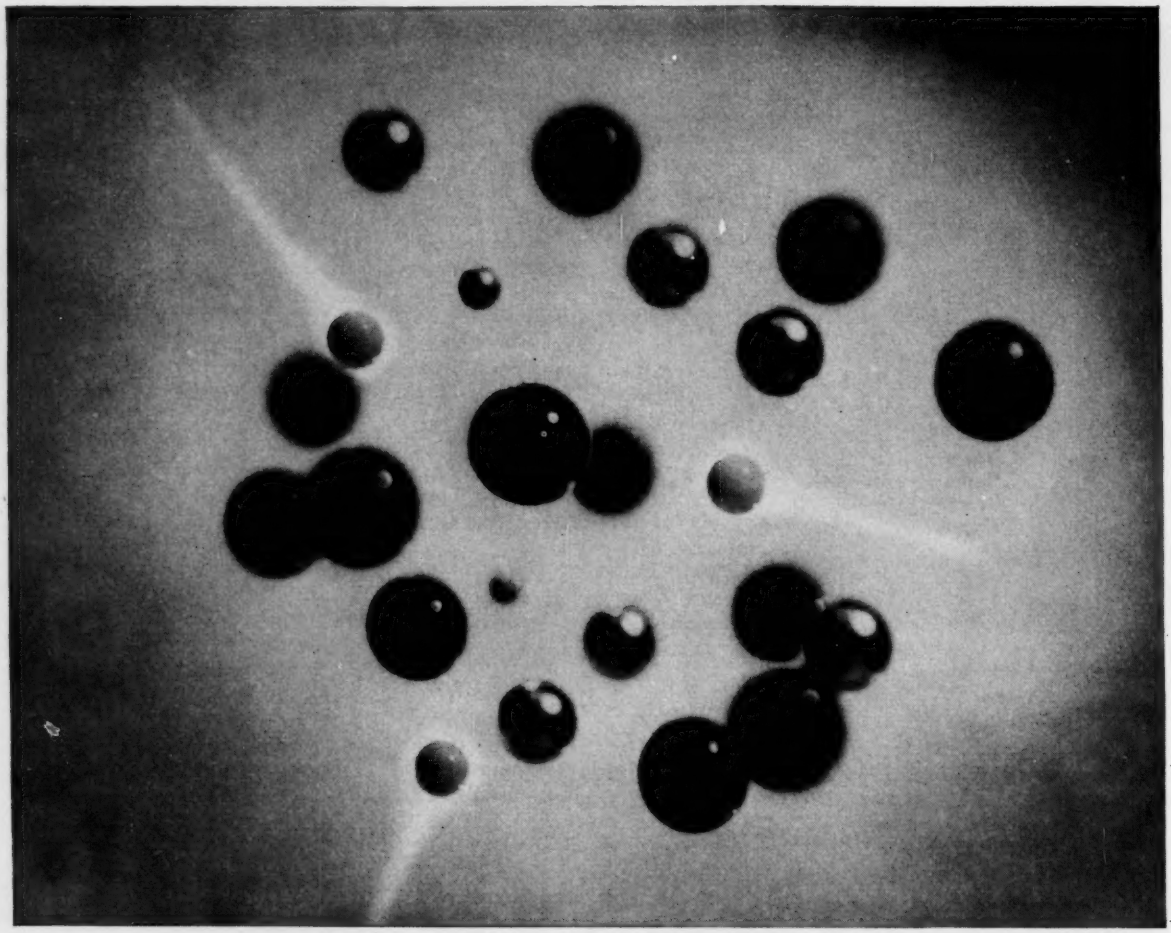
This year, the foundation is especially aware of the danger—to Republicans and Democrats alike—of dependence on relatively few sources of support, most of them with axes to grind. All too often we have seen attempts to buy special consideration in the governmental sphere. Widespread contributions will invigorate the parties and expand their membership.

E. J. Thomas, Goodyear president, comments: "We cannot escape the fact that each of us is in politics every day of our lives. The affairs of government today are closely interwoven with the affairs of our business and private lives. . . . Broadening the base of financial participation in political affairs can make representative government even more representative."

Clearly, here's a program that merits the support of us all. Only the complacent will "let George do it"—or, more aptly, "let Mike do it" all by himself.



Editor-in-Chief



Visual concept of the behavior of lithium ions in a fused salt bath

LILLIPUTIAN

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The lithium ion really puts small size . . . high charge density . . . and directional properties to work. Unlike the ions of other alkali metals, it's trim enough *and* active enough to replace many other metals in a variety of crystals.

The small ionic radius of lithium, 0.60A, immediately suggests lithium's use in systems containing metals with ionic radii ranging from .5 to 1.0A. The resultant balance or unbalance created by such lithium substitutions may be used to produce significant stabilizing or catalytic effects. Ionic radius also makes lithium an excellent addition for increasing conductivity, and its high charge density can effectively decrease viscosity.

Small ionic radius, high charge density, and directional properties are just a few of the many unique characteristics that make lithium well worth investigation. Bring your knowledge of the subject up-to-date by requesting a copy of "Chemical and Physical Properties of Lithium Compounds"—a down to earth collection of facts, figures, and ideas on some 23 lithium compounds. Write the Technical Literature Dept., Foote Mineral Co., 420 Eighteen West Chelten Building, Philadelphia 44, Pa.

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Business Newsletter

CHEMICAL WEEK
August 9, 1958

More U.S.-U.S.S.R. chemical and equipment trade seems likely this week. It will probably come as a result of the decision by NATO nations (including the U.S.) and Japan to effect a "substantial relaxation" of the East-West trade embargo. During still-continuing meetings at Paris, almost 100 items of manufactured goods and raw materials—including chemicals, chemical plants and metals—were stricken from the embargo list. The revision goes into effect Aug. 15.

British industry and government are enthusiastic over the revisions. Several British firms have already dealt with Russia (*CW, July 26, p. 26*). Monsanto Chemicals Ltd. may be the next. The company, a subsidiary of Monsanto Chemicals Co. (St. Louis), is discussing with Russia possible sale of any chemicals not on the embargo list; it sent a four-man mission to Russia in May. The parent company, however, is continuing a separate policy of not selling to any Iron Curtain countries.

Meanwhile, Commerce Dept. is apparently relaxing its East-West trade restrictions that have been even tougher than present NATO rules.

Commerce is licensing Von Kohorn International (White Plains, N.Y.) to send Russia synthetic-fiber-making machinery for the $5-million plant it will build near Moscow. And, a government official told *CW*, Commerce recently licensed some "quite amazing" electronic equipment, with potential military value, for shipment to Russia.

U.S. chemical trade with England will also be easier, although volume likely won't rise much. The British will now allow imports without licenses of industrial chemicals from the U.S. and other dollar areas.

But there's another factor behind the push for East-West trade: total trade in the free world is still sliding. In the first half of '58, it dropped 8% below the level of the same period in '57, the British Treasury reports in its current bulletin.

Exports from the U.S. and Canada account for the biggest share of the drop. U.S. Commerce Dept. figures agree with British data in this—in the first four months of '58, U.S. domestic exports dived 18.7% from the level of the same '57 period. But exports of chemicals and related products resisted the plunge, dipped only 3.8%. Total imports for the period slipped slightly, from $4.4 billion to $4.2 billion. Chemical imports, however, inched up from $96.2 million to $97.1 million.

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Still more first-half earnings reports—and further proof of the uptrend *(p. 24)*:

Nopco Chemical reports that six-month sales, bolstered by a significant improvement in the second quarter, hit $14.4 million, compared

with $14.3 million last year. Earnings for the first half dipped slightly to $1.40/share vs. $1.55 in '57.

Sterling Drug chalked up $8.8 million in after-tax profits during the first six months, 8% higher than in '57. Sales—highest in the company's history for a six-month period—topped $104.8 million, compared with $94.7 million in the first half of '57.

Harshaw Chemical, in the nine-month period ending June 30, showed sales of $45.4 million and net income of $1.3 million—both substantially lower than in the comparable period last year. But profits in the March-to-June quarter hit $500,000, up 84% over the preceding three months.

For Minnesota Mining & Mfg., the quarter just past was nearly up to last year's record levels. For the full six months, sales were down just 2.9%, to $176.3 million; earnings dipped 10.4%, to $17.6 million.

Thiokol Chemical reports first-half sales up 25.7%, to $32.3 million; net income up 3.3%, to $865,756. Sales under government contracts were up 24%, Chemical Division sales rose 28%.

North of the border, Du Pont of Canada upped its sales 12.6% during the first half. Profits, however, slipped to $2.3 million, down 12.8%. And Canadian Industries Ltd. had six-month sales totaling $74 million, down 2%. Earnings fell to 37¢/share, compared with 58¢ last year.

•

"Advanced developments in guided missiles and space travel" will be the goal of a new three-member corporate team composed of Thiokol, Callery Chemical and General Motors. Thiokol and Callery are already involved (*CW, Jan. 25, p. 29*) in another venture. Though the trio will seek contracts as a unit, they are free to work on separate projects or to combine their facilities in what appears to be the most advantageous ratios.

Also last week, Thiokol obtained an independent contract to develop and produce the propulsion system for the Army's Pershing missile, a two-stage, solid-fueled, inertially guided missile with a range of from 500 to 1,500 miles.

•

Extent to which fringe benefits are pushing up labor costs is revealed in a U.S. Chamber of Commerce study released this week. For producers of chemicals and allied products, total payments rose 17.3% from '55 to '57 in terms of dollars per employee per year. They averaged $946 in '55, $1,110 in '57. This is still well above the all-industry average, which rose 19.8%, hit $981 last year. Fringe payments are mounting faster than wages, the study shows—particularly in the chemical industry. Last year, they accounted for 24% of the chemical industry payroll, compared wih 21.8% in '55. For all industry, these payments make up 21.8% of the payroll, up from 20.3% in '55.

For water resistance in rubless polishes . . . use CARBIDE'S Morpholine

If you are making rubless polishes—whether for the home, factory, or office—then you need Morpholine. Reasons why? Morpholine-based rubless polishes dry quickly—fast enough in fact to allow traffic on the floor shortly after application.

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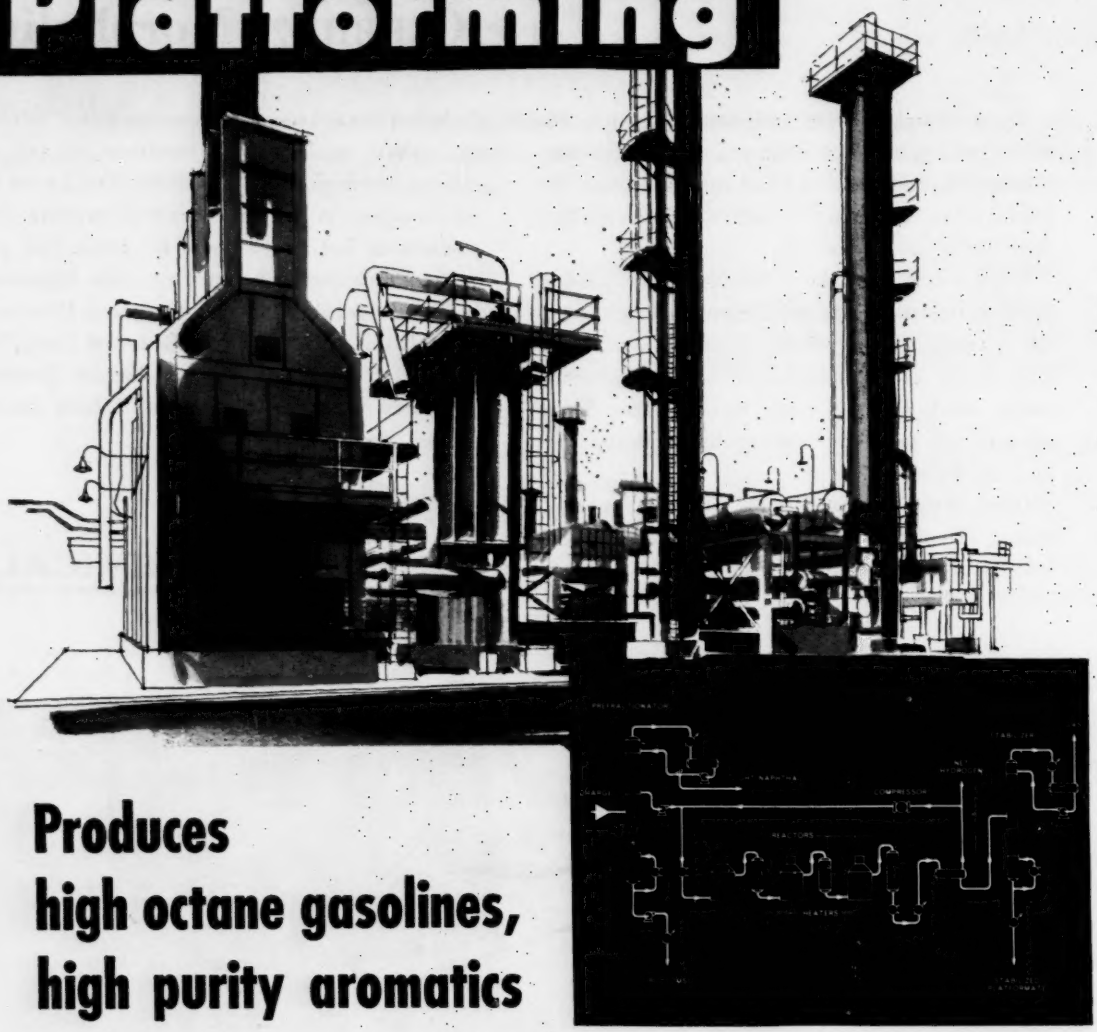

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As shown in the accompanying flow diagram, the Platformer is a compact unit consisting of a reactor section, stabilizer section, and (optional) feed preparation section. It can handle the full boiling range gasolines without prefractionation, or naphtha cuts separated from them, and efficiently processes any naphtha from crude distillation, natural gasoline plants or cracking units.

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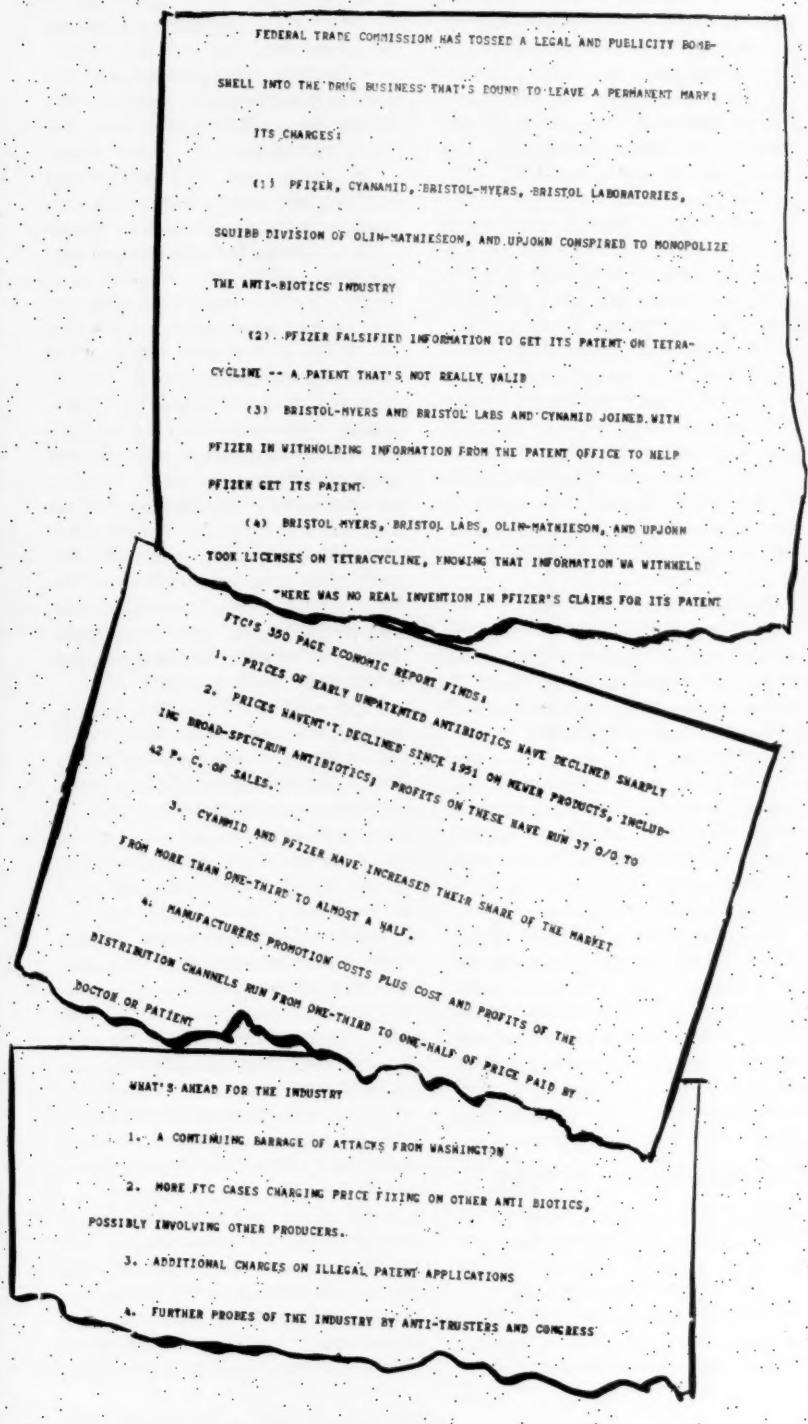
Double Trouble for Antibiotics Makers



The Federal Trade Commission this week tossed a bombshell at the antibiotics industry—a rugged antitrust suit against five of the industry's largest companies, alleging that they charge excessively high prices, and that they deceived the Patent Office in order to get a patent to help them do it. FTC's long-awaited 350-page economic report on the $400-million industry—issued at the same time—is largely used to document the commission's case.

Though the FTC report did have some good things to say about the industry and its role in developing the life-saving "wonder drugs," far more space was devoted to detailing FTC's charge that American Cyanamid, Bristol-Myers, Olin Mathieson, Pfizer, and Upjohn arranged to have a patent on tetracycline issued to Pfizer, then rallied around the patent as a device to limit access to the market and maintain high drug prices.

Even as reports of the antitrust suit were wired to *CW* from Washington, company officials and trade association representatives began to counter the allegations in the report.

Companies Deny Charges: In a heated statement, Pfizer President John McKeen lashed out at the FTC charges, accusing the commission of "attempting to second-guess Patent Office decisions." Said McKeen: "This improper procedure could destroy the American patent system and endanger the drug industry's $130-million annual research program."

He further asserted that "Pfizer has never engaged in a conspiracy, never misused its patents, never fixed prices, and wields no monopolistic powers." In addition, McKeen termed the charge that Pfizer had withheld information from the Patent Office "utterly baseless."

American Cyanamid President W. G. Malcolm also firmly denied FTC's allegations. Said Malcolm, "Cyanamid has not engaged in any price fixing and has not employed any unfair method of competition . . ." He also

pointed out that prescription pharmaceuticals, including antibiotics, "have been almost alone among commodities in resisting the upward price trend of recent years."

Vigorous Defense Promised: Reactions from Bristol-Myers President Frederick Schwartz and Upjohn President Dr. E. Gifford Upjohn foretold an all-out court battle.

Said Schwartz, "We are shocked by the charges of price conspiracy and patent abuse . . . I can state without qualification that these charges are baseless."

And the Upjohn chief executive declared, "It is the intention of The Upjohn Co. to defend its position and prove conclusively that these charges are untrue."

THE LEGAL CASE

The government's antitrust case against the drugmakers is a far bigger blow than its last previous attack—the case filed against the makers of Salk polio vaccine earlier this year. The government charged makers with fixing prices on vaccine sold to government agencies *(CW Business Newsletter, May 17)*.

The heart of the new case is the charge that the five antibiotics makers —after years of intercompany battling—finally got together behind Pfizer's patent on tetracycline. The alleged purpose: to use the patent to keep prices up and others out of the market.

FTC's economic report lists these developments in its chronology of the case:

1949—Cyanamid got a patent (2,482,055) on chlortetracycline (Aureomycin).

1950—Pfizer got a patent (2,515,080) on oxytetracycline (Terramycin).

1954—Cyanamid licensed Pfizer on a 2.5% royalty to make chlortetracycline—as an intermediate in making tetracycline.

1955—Pfizer got a patent (2,699,054) on tetracycline and licensed Cyanamid to make and sell it on a 2.5% royalty.

1956—Bristol was licensed by Pfizer to make tetracycline at a 3.5% royalty rate—and later on, Pfizer licensed Olin Mathieson and Upjohn to sell the product they bought in bulk from Bristol.

Around this chronology, FTC spins its version of the furious competition and the legal suits and countersuits that competition inspired as the companies raced to discover, test and then patent broad-spectrum antibiotics:

"In March '56, the lawsuits were settled out of court. Bristol recognized Pfizer's patent, agreed to pay royalties and licensed Pfizer, at its option, to use and pay royalties on a process patent that Bristol had received for direct fermentation of tetracycline.

"When Cyanamid had recognized the priority of Pfizer's claim [of tetracycline discovery] in Jan. '54, it had agreed to pay royalties on all tetracycline it manufactured if Pfizer should obtain a patent, while Pfizer had agreed to pay royalties to Cyanamid on chlortetracycline it necessarily manufactured and used (not sold) in the making of tetracycline.

"A third link in the final settlement had been forged in Jan. '55, when an infringement suit by Cyanamid against Bristol for manufacturing chlortetracycline in the process of making tetracycline had been withdrawn upon Bristol's agreement to pay Cyanamid (as it later agreed to pay Pfizer) a royalty on all its sales of tetracycline.

"Finally, Pfizer's suits against Olin Mathieson and Upjohn and the actions of these companies against Pfizer were settled by Pfizer's granting them licenses to continue repackaging and selling tetracycline purchased in bulk from Bristol.

"The conclusion of the whole proceedings was that the manufacture of tetracycline was restricted to the three companies that had made patent applications on the product, and its sale to these and two others."

The companies, contends FTC, "either agreed not to contest the decision of the Patent Office as to priority and invention, or settled the issue of priority among themselves and withdrew all the patent applications but one—with the prospective patentee pledged to license the other applicants at a stipulated royalty."

THE ECONOMIC REPORT

The commission's economic report is a $1-million-plus effort of a battery of government economists, lawyers and full-time investigators.

It was initiated on instruction from a Congressional committee, which had received numerous complaints from consumers about excessive prices they were paying for "miracle drugs." In the main, there's enough in the report to satisfy Congressional curiosity, although the report falls short of describing the marketing and pricing practices at the retail level. This may be the subject of another investigation.

Here are the highlights of the economic report:

• Starting from scratch in the 1940's, manufacturers' sales of antibiotics hit a $400-million peak last year, holding top spot among ethical drugs (total sales: $1.6 billion) and equalling the total volume of all proprietary medicines combined. Biggest seller by volume last year was procaine penicillin, with 33% of total antibiotics sales; but tetracycline, with only 7% of unit sales volume, accounted for 24% of the sales dollar, while procaine penicillin had 22%.

• The broad-spectrums — tetracycline, oxytetracycline (Terramycin), chlortetracycline (Aureomycin) and chloramphenicol (Parke, Davis's Chloromycetin)—together racked up $165-million of the $301 million worth of antibiotics that manufacturers sold in '56 from their own production. The latter excludes sales by nonproducers and patent-license royalty payments. Tetracycline sales included in this figure came to $74 million.

Next was penicillin ($67 million), streptomycin and dihydrostreptomycin ($24 million), erythromycin ($18 million), and all others ($27 million). Antibiotics accounted for 40% of Pfizer's '56 sales (the last year covered by the commission's report) and 20% or less of the sales of the other 11 producers.

• The commission makes a sharp distinction in its analysis of the industry between two periods in the development of antibiotics—pre '51 and post '51. Immediately after the war, the materials produced, penicillin and related compounds, were either free of patent restrictions or were licensed widely—with the result that, as more companies entered the market, prices declined.

FTC relates how penicillin output multiplied six times between '48 and '56, and streptomycin by almost eight times. It pointed to how "spectacular cost reductions set the stage for price reductions." Bulk prices of these drugs, FTC notes, dropped 99% from

their introductory levels. This also resulted in many companies being forced out of the business: by '56, only seven companies were making procaine penicillin and five were producing the streptomycins.

• The transition between the two periods in the development of the antibiotics industry, in the commission's view, stemmed from the drugmakers' desires to discover "patentable antibiotics which could be marketed as exclusive products possibly insulated against aggressive price competition." As evidence, it points out that there have been no reductions for broad-spectrum antibiotics since '51—except on sales to the armed services, and reports that tetracycline—which was introduced in '54—was priced at the '51 freeze level.

• There has been a dramatic change in the number of products controlled by only one producer, the FTC contends. In '48, only four of 11 antibiotics in commercial production were manufactured by just one firm; seven were made by more than one company. FTC contrasts this with '56, when 17 of the 29 antibiotic substances produced were each made by but a single company, four materials were each produced by two companies, two materials by three companies, one by four companies, two by five companies, one by six companies, and two by seven firms.

• Of the developers of many of the antibiotics produced since '49, FTC reports: "At most, they were willing to grant licenses to those competitors whose parallel research had made them rival applicants for patents covering the same product, or, in some instances, to partners in research and patent-pooling and exchange agreements."

Firms Make Less Profits: FTC's report bears down heavily on the price stability of the newer antibiotics, but its own evidence shows that the profits made by their manufacturers have generally declined.

From its financial reports from the companies, FTC finds that net operating profit was 50% for the broad-spectrum antibiotics in '51, but that it declined to 37% in '56. In '51, the profit on penicillin was 23% of sales, but for every year between '52 and '56, makers had operating losses. Manufacturers of the streptomycins showed losses from '53 through '56.

Output doubled from '51 to '56—but dollar sales dipped 10%. They rebounded past the '51 peak last year. Both facts are traced to sharp price cuts and higher production of older types of antibiotics.

THE FUTURE

Obviously, the makers of antibiotics are in a most unenviable position—from the public relations point of view as well as the legal one. They, like the Salk vaccine producers, have found themselves praised by the public and by government officials while in the research, development, testing and first marketing of new drugs—but they're suspected of collusion and price fixing as their products come into good supply. To many purchasers, the memory is not that a prescription containing an antibiotic cured an illness almost overnight, but that 10 capsules may have retailed for $5. The wonder has worn off—and all the consumer remembers is a high price.

This points to one area that is bound to get more attention—the markups of wholesalers, hospitals and druggists. The commission noted in its report that this important area is one that it couldn't dig into for lack of money and manpower.

The Patent Question: Congressional critics of the Patent Office and the present state of the patent system will get added ammunition from FTC's allegations that patent officials were flim-flammed in the granting of the Pfizer patent on tetracycline. The FTC complaint may well serve to bring the issue sharply to the attention of the consuming public—something that is difficult to do on issues as technical as patent law and procedure. This may spark a real move to overhaul the whole patent system.

The Legal Battle: One thing is sure, as far as the companies charged by the FTC are concerned: they have no easy way out. The fight on their hands may well go to the U.S. Supreme Court.

Thus, they may well provide the high court with a chance to rule on a basic antitrust issue: Where should the line be drawn between the legal use of the monopoly granted by a patent and the use of a patent in a way that is in restraint of trade?

MCA—Calm in Chaos

After almost eight years, an industry-approved food additive bill appears certain to become law this month. And credit for the long-awaited legislation goes largely to the Manufacturing Chemists' Assn., Capitol Hill observers agreed this week.

Earlier versions of this bill had been stuck in the House Commerce Committee pigeonhole since 1950. Last fortnight, after a round of last-minute negotiations between MCA President John Hull, MCA staff specialists, and members of the committee, the bill finally got to the House floor. Full House and Senate approval is almost certain.

But that accomplishment was just one of many industry services performed by MCA during the week of July 21-26—right in the middle of the annual chaos that inevitably precedes the ending of a session of Congress.

End-of-Season Whirl: This is how MCA—with a 20-man staff, backed by some 40 lower-echelon aides and secretaries—was keeping on top of the job in that typical late-July week during the current close-of-Congress rush:

• It filed a statement against the House antitrust subcommittee's measure that would require that manufacturers grant a functional discount on goods sold to wholesalers. In the chemical industry, MCA declared, such a requirement would be virtually unworkable.

• MCA spokesmen testified in support of House-approved amendments to the antidumping act, and opposed more drastic changes in the Senate bill.

• In a letter to the Senate Finance Committee, MCA urged approval of a House-passed bill to permit a refund of customs duties on all imported goods that are processed in the U. S. and then re-exported.

• And on behalf of producers, shippers and users of industrial alcohol, the association sent the same committee another letter. It urged approval of amendments—worked out by MCA and the Internal Revenue Service—on a long-pending bill to clarify tax laws.

• For its metals processing members, MCA kept a close watch on House and Senate action to extend

the law permitting barter of about $500 million of surplus grain for imported strategic ores. The chemical trade group is backing moves to restore the right of U. S. firms to process bartered ores.

• The Kennedy-Ives "antiracketeering" labor bill drew MCA's fire. It urged members to oppose the provision requiring detailed annual reports on employer communications which are intended to influence employees' organizing and collective bargaining rights.

• Away from the harried halls of Congress, MCA kept some more wheels turning. The association sent two spokesmen to Chicago to oppose certain provisions of the American Medical Assn.'s proposed regulations for labeling hazardous products (*CW, Aug. 2, p. 23*).

Meanwhile, during that busy week in July, MCA education director William Chace was putting the finishing touches on plans for a mid-August premiere of two new motion pictures produced under his $188,000/year budget. And MCA's board of directors instructed the Washington staff to keep in touch with the Soviet move to gain U.S. chemical process equipment and know-how.

One for Monsanto

The curtain fell last week on Act One of the phosphorus trade secrets litigation, with Monsanto Chemical Co. winning a clear-cut victory in U. S. district court at Salt Lake City. For Act Two, the scene will shift to the federal district court at Pocatello, Ida., with trial scheduled to start in November.

Ending of the action at Salt Lake City came when Judge A. Sherman Christenson read his final judgment against defendant Charles Miller, former Monsanto employee now employed as engineer for Central Farmers Fertilizer Co. (Chicago). In general, this decree follows the legal paths outlined previously in the court's transcript of comments (*CW Business Newsletter, May 3*).

Data to Be Returned: Judge Christenson does not assess damages, but he permanently enjoins Miller from using Monsanto trade secrets in designing and building Central Farmers' elemental phosphorus unit. The Central plant is now under construction at Georgetown Canyon, Ida. Also, Miller is ordered to return to Monsanto 102 documents that were found to have been "unlawfully appropriated" when Miller left Monsanto.

The decree was not directed against F. C. Torkelson Co. (Salt Lake City), design engineers for the Central Farmers project, except that Torkelson and Miller were told to pay Monsanto's court costs.

New Design Consultant: Later last week, Central Farmers—which is owned by 14 farm cooperatives—revealed it has engaged H. K. Ferguson Corp. (San Francisco) to take over design engineering duties for its elemental phosphorus furnace. Torkelson will handle other aspects of the project.

Central Farmers was listed as a defendant in the Salt Lake City suit, but was not served with a copy of the complaint and did not make an appearance in the court. Judge Christenson's decree states that "nothing herein is intended as a determination of issues of fact or law as against Central Farmers Fertilizer Co., over which this court has no jurisdiction."

So any issues between Monsanto and Central Farmers—such as whether there should be any limitations on operation as well as design of the plant—remain to be thrashed out in the Pocatello trial this fall.

LATEST SECOND-QUARTER EARNINGS: UPHOLDING THE UPTURN

Late-reporting companies provide further proof of rising sales and profits in the spring quarter (CW, Aug. 2, p. 22):

	Sales 2nd qtr. '58 (Million $)	Change from 2nd qtr. '57	Change from 1st qtr. '58	Earnings 2nd qtr. '58 (Million $)	Change from 2nd qtr. '57	Change from 1st qtr. '58
Carter Products	11.6	up 2.9%	up 4.5%	1.6	up 2.1%	up 3.1%
Celanese	54.8	up 13.1%	up 12.0%	3.2	up 18.1%	up 27.2%
Crown Zellerbach	114.8	down 1.6%	up 5.7%	6.8	down 26.8%	down 8.0%
Cutter Labs	5.8	up 5.6%	up 38.5%	0.3	up 2.7%	up 159.8%
Eastman Kodak	189.1	up 2.3%	up 15.0%	22.5	down 0.1%	up 52.0%
Heyden Newport	11.9	down 4.9%	up 7.7%	0.3	down 53.7%	down 18.7%
Interchemical	27.2	down 4.0%	up 5.1%	1.2	up 14.9%	up 98.4%
Kennecott Copper	88.6	down 28.4%	up 4.6%	11.3	down 47.5%	down 3.0%
Koppers	66.8	down 16.4%	up 4.9%	1.2	down 61.2%	up 22.0%
Metal & Thermit	8.4	down 23.3%	down 0.6%	0.2	down 61.9%	down 10.0%
Minerals & Chemicals	3.8	down 4.5%	up 1.6%	0.3	down 26.1%	up 99.9%
National Starch	11.6	up 4.2%	up 8.7%	0.8	up 8.5%	up 31.7%
Norwich Pharmacal	8.9	up 4.7%	up 11.0%	0.9	up 6.2%	up 10.6%
Smith Kline & French	30.7	up 8.1%	up 0.1%	5.4	up 6.9%	up 7.0%
Parke, Davis	40.3	up 5.9%	down 5.9%	6.3	up 14.0%	down 12.2%
Texas Gulf Sulphur	14.2	down 26.4%	up 16.6%	3.5	down 35.5%	down 0.3%

EXPANSION

Molybdenum: Construction of Climax Molybdenum's new $1-million plant in Coldwater, Mich., is now under way. It will produce molybdenum metal and molybdenum-based alloys. Climax, division of American Metal Climax, Inc., earlier purchased a one-story factory building near the site.

•

Nuclear Research: Union Carbide Nuclear Co., division of Union Carbide Corp., has awarded a contract for construction of its nuclear and ore laboratories near Tuxedo, N.Y. Work will begin immediately, is scheduled for completion by mid-'59. Contractor: Joseph L. Muscarelle, Inc. (Maywood, N.J.).

•

Propane: Minneapolis Gas Co. (Minneapolis) will build a $1-million liquid propane storage plant in New Hope, Minn., a suburb of Minneapolis. The new unit will have equipment to vaporize liquid propane and mix it with air to produce the gas mixture that is normally distributed to consumers in the area.

•

Process Equipment: Vulcan Mfg. (Cincinnati), a designer and builder of chemical process equipment, is acquiring and expanding a factory owned by Gemco Mfg. Co. on the outskirts of Cincinnati.

Vulcan is signing a long-term lease with an option to purchase the plant, will invest $1 million to double its size. Construction will start this month. Target date for occupancy is Jan. 1, '59.

COMPANIES

Central Soya Co. (Fort Wayne, Ind.) has completed negotiations to acquire Glidden Co.'s Chemurgy Division. The agreement calls for Soya to purchase the division's inventories and supplies Sept. 1 and sign a three-year, option-to-buy lease on its production and grain storage facilities.

The deal includes Chemurgy's soybean processing operations and storage units in Indianapolis, Chicago, Seneca, Ill., and Lockport, Ill., as well as equipment for producing soya lecithin, industrial and edible proteins, soya flour and other products.

•

Arkansas Louisiana Chemical Corp., a subsidiary of Arkansas Louisiana Gas Co., has received approval from the government for a 25-year lease of the Army's Pine Bluff Arsenal chemical plant at Pine Bluff, Ark.

Capacity of the unit, formerly operated by Diamond Alkali Corp., is rated at 75 tons/day of chlorine and 84 tons/day of caustic. Production will get under way within 90 days.

•

Kaiser Aluminum & Chemical Corp. has reopened two aluminum potlines that it had shut down earlier this year. The lines are at Kaiser's Chalmette, La., and Mead, Wash., producing units. Reopening them will result in the rehiring of 150 workers at each plant.

•

W. R. Grace & Co. is forming a new subsidiary, Grace Electronic Chemicals Inc., to serve as sales representative for International Metaloids Inc., its new Puerto Rican subsidiary, which will produce high-purity silicon. Grace holds majority interest in both firms with the French firm Pechiney holding the remainder.

International Metalloids is now building a new 20,000-lbs./year plant outside of Towa Alta. It's due on-stream in six weeks. At that time, Grace Electronic will sell output from the plant. Meanwhile, it will market silicon produced by Pechiney.

•

Guardian Chemical Corp. (Long Island City, N.Y.) has acquired a controlling interest in Shield Chemical Ltd. (Toronto, Can.). In exchange for 147,500 shares of Shield, Guardian granted the Canadian firm exclusive licenses to make its products in Canada and in the British Commonwealth. Guardian President Alfred Globus said the company is now negotiating with several firms overseas for similar acquisitions.

•

United States Rubber Co. will close its Fort Wayne, Ind., rubber products plant because, say U.S. officials, the company can't operate the plant at a profit. About 700 employees will be affected by the closing, which will take place gradually over a period of about four months. Contributing factors: severe competition from smaller manufacturers and "consistently higher-than-competition wage rates."

FOREIGN

Coke/Russia: Russian news sources report a battery of 77 coke ovens—one of the largest such installations in the world—recently went into operation at Russia's big coke and chemical works in the Donets Basin. Each oven reportedly has 39-cu. yd. capacity.

•

Alcohol/Argentina: Dirección de Industrias Nacionalizades y del Estado, the state combine of Argentina, will reopen its alcohol plant in San Nicolas, province of Buenos Aires.

The plant has been closed down for the past 10 years but assets are valued at about $19 million. DINIE says it will invest about $1.9 million to start producing at a 15-million liters/year pace six months after the opening. Total capacity: 72 million liters annually.

•

Acetic Acid/India: Godaveri Sugar Mills Ltd. will build a 2,000-tons/year acetic acid plant near Bombay, India. The $273,000 unit is due to start production before year-end. Engineering contractor is a Swedish firm, AB Chematur.

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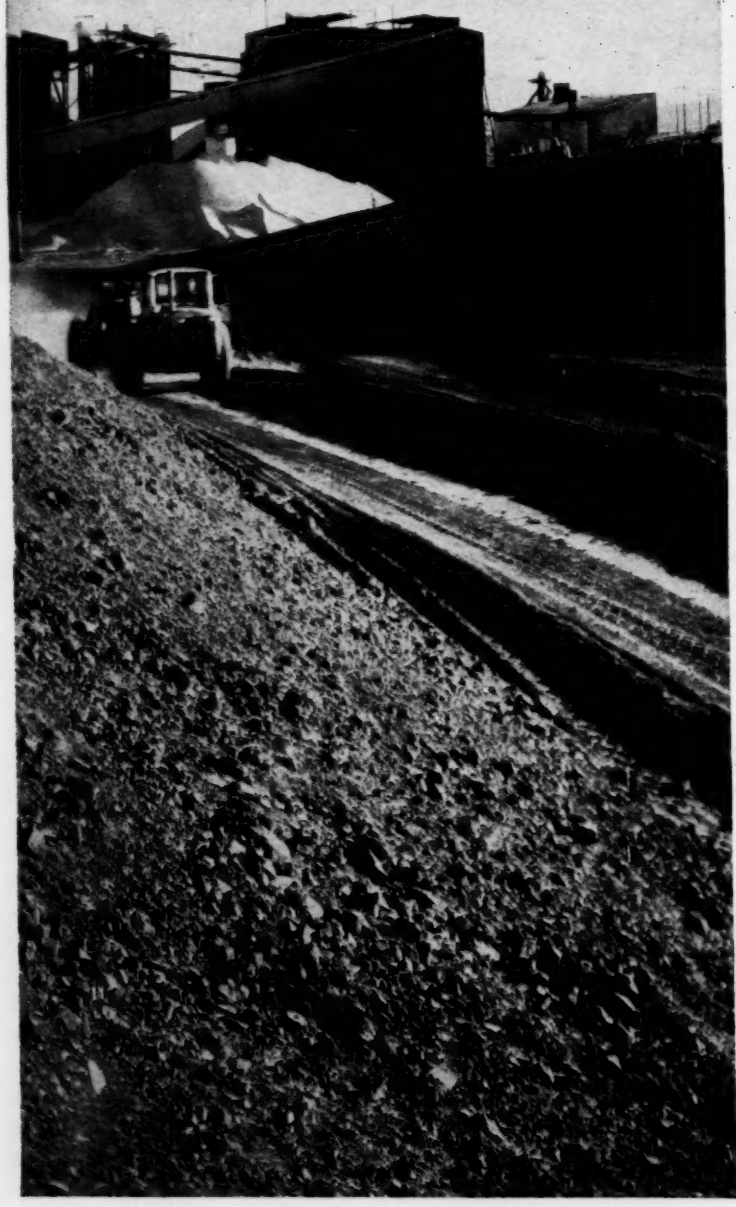

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Washington Newsletter

CHEMICAL WEEK
August 9, 1958

The Justice Dept. may enter the antibiotics monopoly case (*p. 21*). Antitrust officials say there are legal angles neither FTC nor the Patent Office can touch. Among the possibilities: (1) a triple-damage suit based on alleged overcharges to the armed services and the Veterans Administration; (2) a Justice Dept. antitrust case that could bring stiffer penalties—fines and jail sentences—than FTC's cease-and-desist orders; (3) a suit to cancel the Pfizer patent.

Sen. Joseph O'Mahoney (D. Wyo.) is already demanding that Atty. General William Rogers file suit to revoke Pfizer's tetracycline patent, which FTC charges was obtained by fraud. O'Mahoney's Senate Patents Subcommittee will run its own probe of the fraud charges to build up steam for Justice Dept. action.

The Patent Office, itself, is powerless to upset the patent. All it can do is disbar culpable attorneys. Only Justice Dept. can seek to have a patent canceled for fraud.

•

As Congress rushes toward adjournment, this is what you can expect on two important issues:

Labor reform legislation. About the only item that Congress will have passed on labor reform will be legislation tightening control of union health and welfare funds. Democrats feel they can go to the voters with that legislation and avoid a serious fight over the broader Kennedy-Ives labor union reform measure.

Chances are good that the welfare legislation will finally be voted, although Capitol Hill experts caution that differences between Senate and House members could stymie the bill in the adjournment rush.

The Senate bill would put policing of welfare funds in the hands of the Secretary of Labor; the House version would require trustees to make full disclosure of operations direct to beneficiaries. Agreement is expected, but is not certain.

The Kennedy-Ives labor union reform measure has been bottled up by the House Labor Committee, and Democratic leaders expect to keep it there. Business organizations such as the National Assn. of Manufacturers and the U.S. Chamber of Commerce oppose the measure.

Aid to metal and mineral producers won't be agreed upon before Congress adjourns. The bill calling for a copper stockpile and federal price subsidies for lead, zinc and other minerals was aimed at setting up a five-year support program. But Senate-House differences over how the program should be financed mean that at best the whole situation will come up again for a vote next year, even if the money is provided for first-year operations.

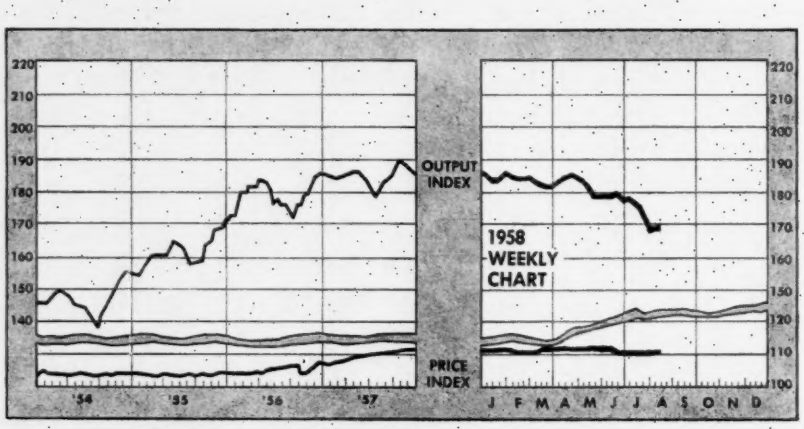
Question is whether to finance it through direct Congressional appropriations, or give authority to the Secretary of the Interior to borrow the money from the U.S. Treasury. First-year costs would be about $150 million; the total five-year costs would be $400-$450 million.

•

A modest price boost for helium is ahead. Bureau of Mines, sole producer besides Communist nations, says it intends to raise its selling prices slightly to amortize the cost of a $12-million plant the federal agency plans to put up to extract helium from natural gas from the Keyes, Okla., area. The House recently okayed the $12-million expenditure for the new plant, which will increase U.S. helium capacity to 600 million cu.ft./year by '60, from today's 360 million cu.ft. Current prices: $19/-1,000 cu. ft., in tank-car quantities to nongovernment customers and $15.50—the average cost of production—on sales to federal agencies.

•

Industry is solidly backing the Euratom program, which is up for final approval by Congress. Under the agreement, the U.S. will sell the six-nation European group 30,000 kilograms of contained uranium-235. Commercial fuel-element fabricators in this country will get the first shot at this business. In addition, the U.S. will reprocess spent-fuel elements at established U.S. prices. Dozens of companies have told Congress they're all for the program.



Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	169.0	169.5	179.0
Chemical Week wholesale price index (1947=100)	110.7	110.7	110.5
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	43.63	43.02	46.04

MONTHLY Employment (thousands)	Latest Month	Preceding Month	Year Ago
All Manufacturing	15,181	15,025	16,839
Nondurable goods	5,070	4,977	5,331
Chemicals and allied products	503.9	512.4	542.3

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Four-Week School

Most of the teenagers pictured on these pages had, by last week, settled into the relaxed routine of the student-on-vacation. But mingled with their thoughts of sundry summer activities were sober reflections on their recent close look at the possibilities of scientific and technical careers.

For four weeks (June 23—July 18), these tenth graders attended the Delaware Science Day Camp at Wilmington, jointly sponsored by Du Pont, Atlas Powder, Hercules Powder, Delaware chapter of American Chemical Society, local branches of engineering societies, Delaware Power & Light and the General Motors assembly plant at Wilmington. Interested students from all over Delaware were given an opportunity to learn more about science and scientific careers through lectures, demonstrations and plant tours (such as the facilities at Hercules Powder's research labs and Du Pont's Hagley Museum, *see pictures*).

Second Year of Operation: The program began last summer, with Du Pont putting up all of the $2,500 cost of running the camp. When it came time to begin thinking about this year's activities, program organizers found that interest and enthusiasm were widespread. Other companies wanted to become sponsors, and many more youngsters than could be accommodated wanted to attend the camp. Moreover, the President's Committee on Scientists and Engineers wanted to send representatives from Washington to observe the camp in action (*see pictures*).

George Seidel, technical advisor in Du Pont's public relations department and present chairman of ACS's Delaware section, got the idea for the camp several years ago while serving on the section's education committee. Since then, he has been the spark plug and executive head of the program.

Field commander for the camp is Ruth Cornell, chairman of Wilmington public schools system's secondary

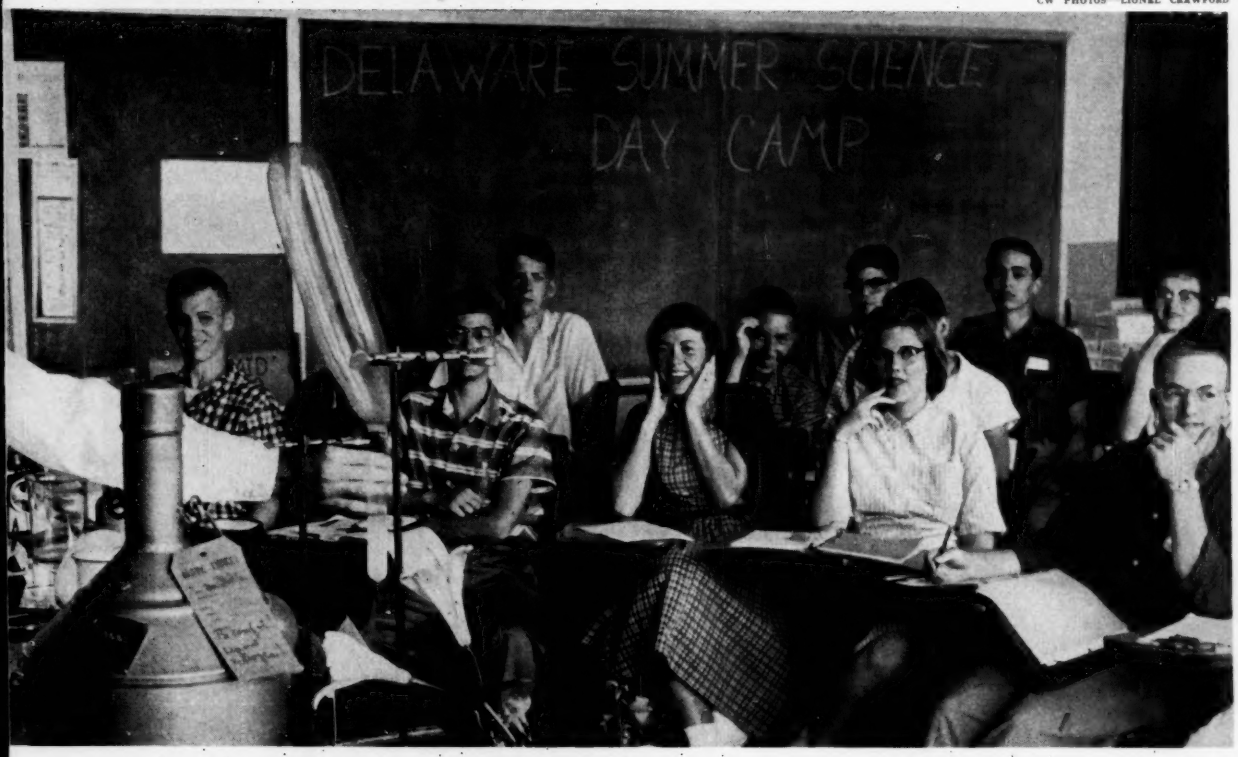
Powderhorns at Du Pont's Hagley Museum make exhibit on Delaware's early history.

Day campers look on

Youngsters tell federal program helped them de-

Surveys Science for Teenagers

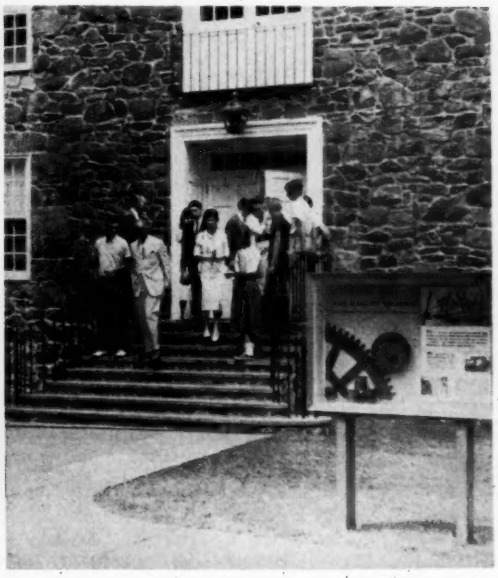
CW PHOTOS—LIONEL CRAWFORD



expectantly as guest lecturer inflates balloon using liquid nitrogen. Lecture was part of four-week program.

observer Vinogridoff how cide on scientific careers.

Museum display shows students important role of the science of gunpowder in early America.



Leaving museum, 'future scientists' discuss Hercules' research and Du Pont's history.

Life on the Chemical Newsfront

NEW IDEAS IN BEAUTY are transforming bathroom design and decoration with the help of modern FORMICA® *laminated plastics.* Especially popular is the Vanitory, combining the countertop lavoratory, make-up bar, cabinets and other units with FORMICA wall surfacing for distinction and convenience. FORMICA laminates provide color and pattern variety, durability and economy, resistance to stains, easy cleaning and warm, smooth touch through superior qualities imparted by melamine resins. (The Formica Corporation)

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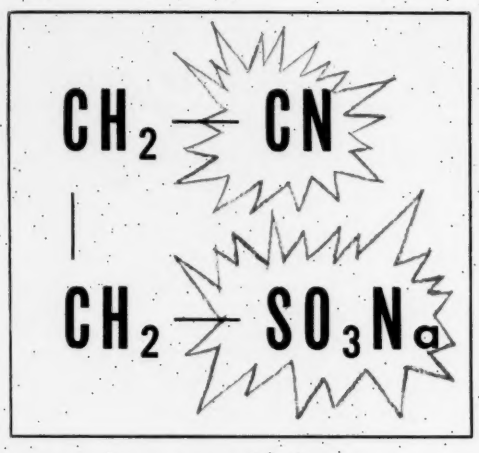
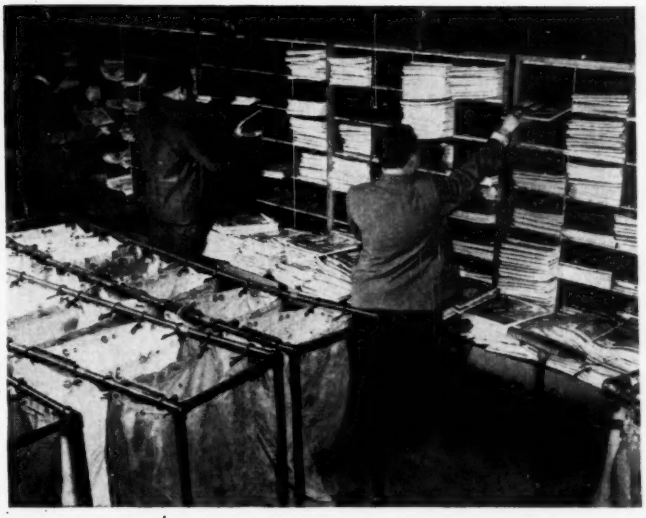
LOSS OF COAL OR MINERAL FINES through wind and rain erosion during shipment in open railroad cars or in open storages is sharply retarded by AEROSPRAY® 52 *binder.* Applied as a spray, this water emulsion polymerizes and forms a tough protective crust in the upper layer of fines. While the crust does not prevent percolation of water, it is insoluble and not destroyed by rain. AEROSPRAY can also be used on stockpiled mineral or coal fines, chemicals or silt to prevent wind loss or objectionable dusting. (Organic Chemicals Division)



A NEW BIFUNCTIONAL DERIVATIVE of acrylonitrile, *sodium β-sulfopropionitrile* is now available in experimental quantities from Cyanamid. Melting at 243-244° C, soluble in water, hot methanol and glacial acetic acid, this interesting chemical combines the functionality of a nitrile group and a sulfonic acid group. It offers a synthetic route to a variety of molecules of interest in pharmaceuticals, surfactants and other fields. Potentially, sodium β-sulfopropionitrile could be produced commercially in the bulk chemical price range. If you would like to explore its possibilities, write for additional information. **(Market Development Department)**



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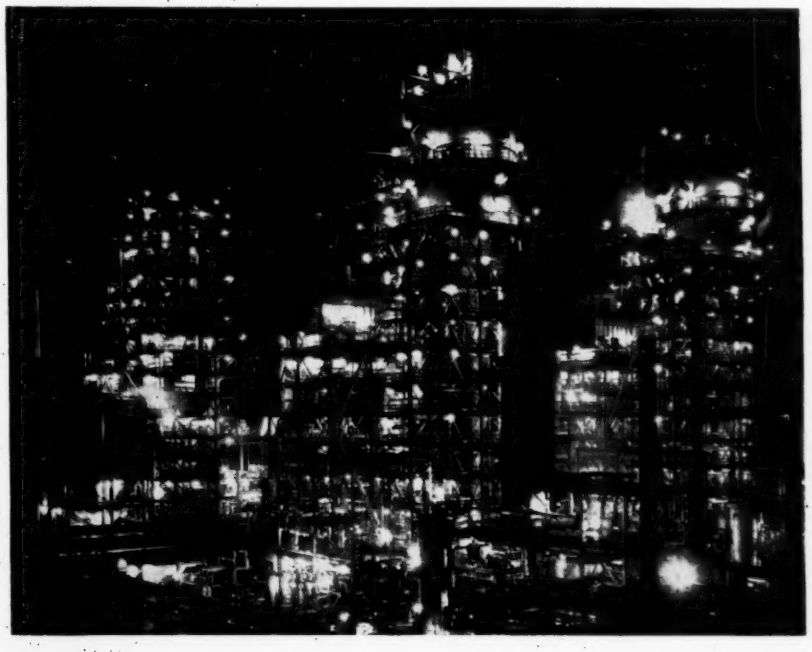

NEW ECONOMY IN CRACKING UNITS — AEROCAT® 2000 *fluid cracking catalyst,* designed for "problem" operating conditions (such as heavy metals contamination) in catalytic cracking units, has just been introduced by Cyanamid and is now commercially available. AEROCAT 2000 provides activity stability with greater economy than other low-cost catalysts. It offers an octane advantage, superior attrition resistance, and lower production of coke. It has controlled bulk density for better fluidization properties. Extensive testing on principal types of gas oils show the new catalyst to have outstanding catalytic properties.

(Industrial Chemicals Div.)

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science department. In both seasons of the camp's operation, she served as camp director and counselor.

Statewide Representation: Thirteen girls and the same number of boys, representing 17 public and parochial schools throughout the state, attended this year's day camp. Transportation from and to their homes daily, via chartered buses, was paid for from the camp's operating budget. Each student paid $25 tuition fee to help defray expenses.

Each day-camper was required to have the following qualifications: parents' approval, good grades and teachers' recommendation. In addition, each had to write a paragraph on his interest in science. From the list of applicants, Seidel, Ruth Cornell and the chairman of the education committee of ACS's Delaware section selected as many youngsters as the camp could accommodate.

Registration was restricted to tenth graders, since they would best be able to fashion their remaining high school curriculum along lines suggested by their experiences at day camp.

Federal Back-Pat: Federal government interest in the Delaware Science Day Camp arose last year when word of the project reached the President's Committee on Scientists and Engineers. The program was nationally publicized by the committee as an example of "local action" in the promotion of science and engineering. As a result of the publicity, and using the Delaware example, a half-dozen "local action" programs have been set up in the East, including a science day camp near Washington, D.C.

This year, the committee, showed interest in the program and sent its staff director, Eugene Vinogridoff, and staff consultant, John Laferty, to the Wilmington camp to observe a typical camp day.

Range of the answers to questions posed by Vinogridoff and Laferty concerning the camp's value, included: "It helped me decide on the type of science career I want"; "It changed my concept of scientists. They're not a bunch of odd-balls." One student said the camp had helped him decide against pursuing a technical career.

Significance of the science day camp and similar programs, said Vinogridoff, is summed up by statistics revealed by the President's committee:

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"The U.S. is entering a period of reduced manpower between the ages of 25 and 34. In '65, there will be 700,000 fewer men in this group than there are today, because of the drop in the number of births during the depression '30s." To help make up the manpower deficit and to win the technological race with Russia, Vinogridoff feels, "we must do everything possible to attract capable young people into the fields of science and engineering."

Small Firms Get Help

Congress last week took actions that may have broad impact upon small chemical businesses. In the first move, the House passed a bill to increase first-year depreciation allowances for small businesses; the second action provides funds that will enable the National Labor Relations Board to extend its jurisdiction into the so-called "no man's land" of small labor cases.

The depreciation measure, almost certain of enactment by the Senate and approval by President Eisenhower, provides that an extra 20% depreciation deduction may be taken in the first year after purchase of machinery, equipment and "other tangible property" except buildings.

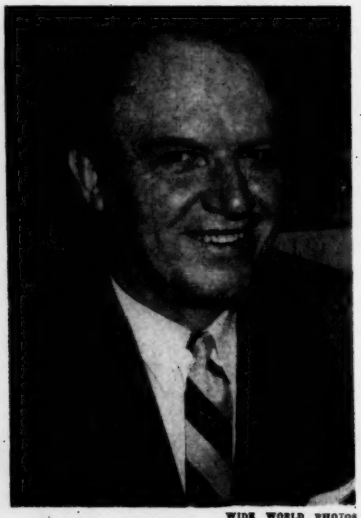
The deduction—applicable to all corporations, large or small—would apply only to the first $10,000 in acquisitions ($20,000 in cases of unincorporated businesses where husband and wife file a joint return) and would be subtracted from the original cost to determine the base for normal depreciation.

The provision is further limited to assets acquired after Dec. 31, '57, with a useful life of at least six years. Assume, for example, that a new machine costing $10,000, with a useful life of six years, is purchased this year. Under the new bill, a special depreciation deduction of $2,000 (20% of $10,000) could be taken. The remaining $8,000 could be depreciated by standard procedures to give a total first-year deduction of $4,666—almost half the original cost.

Though opposed by some as insufficient relief for small business, it is generally regarded as liberal under current conditions of government spending. Rep. Wilbur D. Mills (D., Ark.), chairman of the House Ways & Means Committee, said, "We can't afford more."

Labor Relations: Now that it will have more money, NLRB will considerably broaden its area of operations, beginning Sept. 1. The board has consistently refused to act in all areas in which it legally has jurisdiction, claiming it lacked the funds and manpower to do so. Now, NLRB Chairman Boyd Leedom can enlarge his staff, and the board will be able to accept cases at plants directly or indirectly doing $50,000/year worth of business (buying or selling).

Representative Mills: 'We can't afford any more' on tax allowances.



WIDE WORLD PHOTOS

NLRB's Chairman Leedom: More funds, more service from the board.

Upping Property Tax

New moves to increase tax revenues have cropped up in several areas tenanted by chemical process firms.

In Colorado, for example, officials of Jefferson County, a suburb of Denver, seek to collect $2 million annually in property taxes from three companies operating defense plants on government-owned property. The county has fixed assessments totaling $42,384,640 on property of Martin Co., building the Titan intercontinental ballistics missile southwest of Denver; Air Products Inc., making liquid oxygen for the Titan; and Dow Chemical Co., operating a weapons plant at Rocky Flats for Atomic Energy Commission.

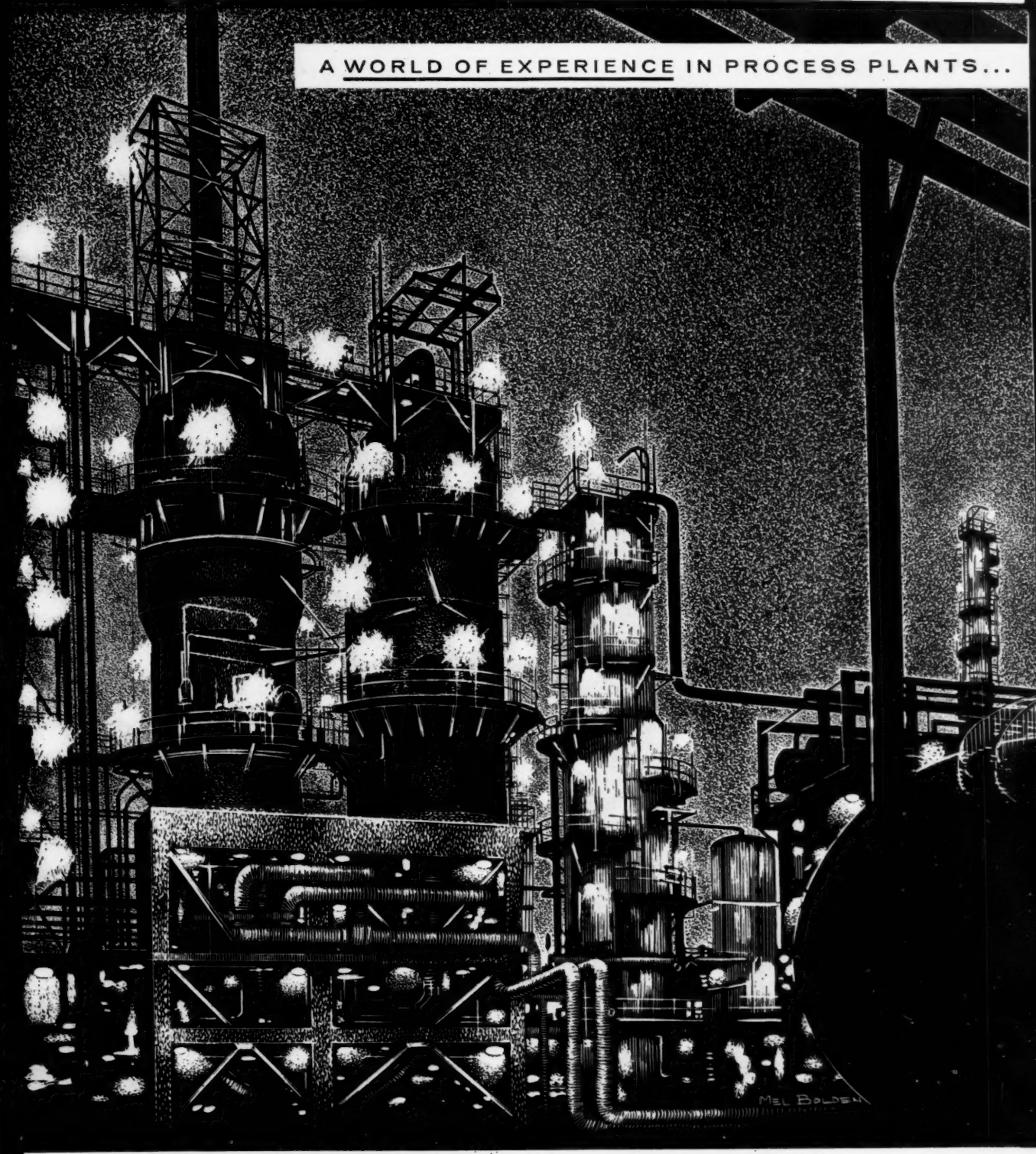
County officials say they will tax only the property that the companies "are using to make a profit." Their action results from a recent U.S. Supreme Court ruling that Borg-Warner Corp. was subject to Michigan property taxes on a government-owned plant it operated.

To obtain a court test of legality of the assessments, Martin, Air Products and Dow will have to pay taxes under protest in Jan. '59 and appeal the assessment to Colorado district court, according to local authorities.

M. J. Sunderland, chief of the administrative branch for AEC at Rocky Flats, tells *CW* he will take the matter to court. "Dow doesn't have a penny invested here," he says, "and certainly the government property is not subject to state taxes."

Says Dow: "In our opinion, the recent Supreme Court decision covering assessments on government contractors does not apply [here] . . . Dow is acting merely as a hired hand for AEC." The firm has joined with AEC in protesting the assessment.

Valuation Opposed: In Orange, Tex., Du Pont and Firestone Tire & Rubber have come up against revaluation actions. Du Pont objected to revaluation that departs from standard techniques, claims it includes factors based on the earning power of the plant as well as on fixed value of buildings and equipment. In essence, taxes would shift with the tides of business, Du Pont charges, in a manner that would distort the county tax structure and increase the tax problems of the county and the company. Firestone, while accepting the



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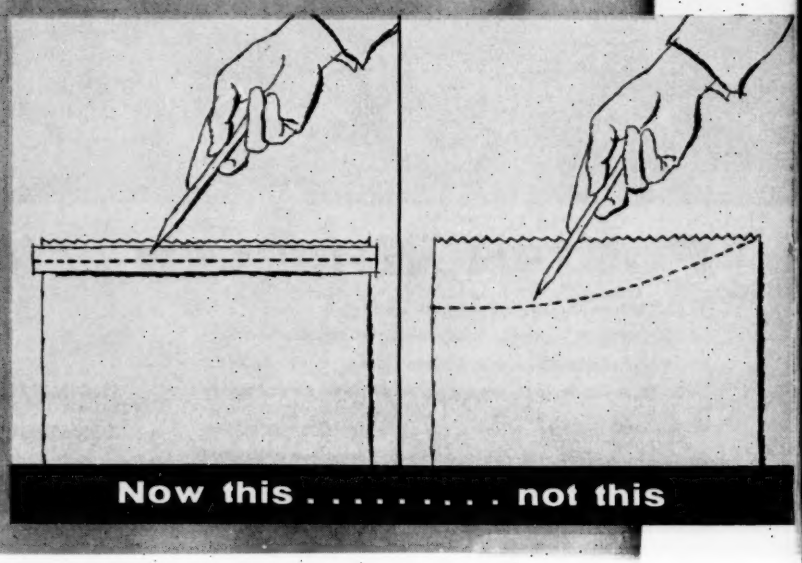
New SEW-STRONG increase bag strength

New SEW-STRONG Open Mouth Multiwalls are reinforced at top-and-bottom sewing lines with strips of heavy reinforcing kraft. Extra protection where you need it most.



open mouth Multiwalls ...help reduce costs!

Union's SEW-STRONG closure for Sewn Open Mouth Multiwalls now offers you the same money-saving advantages available in SEW-STRONG Sewn Valve Bags.

SEW-STRONG now has been perfected for Sewn Open Mouth Multiwalls. This unique closure method (heavy reinforcing tape strips at each side of the top-and-bottom sewing lines) is remarkably effective. It's simple and extremely low-cost, too, for the sewing reinforcement is added on the *outside* of the bag.

Stronger bags

Tests show that 95 per cent of all sewn Multiwall breakage—aside from tears, snags and scuffing—occurs at the sewing line. SEW-STRONG's special reinforced sewing line construction practically eliminates this breakage.

Lower costs

There's a good chance SEW-STRONG's added strength at the sewing lines can help reduce your costs by reducing basis weight—at no sacrifice in strength. Actual savings will, of course, depend on the present basis weight of your bags, your product, and how it is normally handled.

Up to 3" shorter bags!

You can close SEW-STRONG Open Mouth bags right at your plant using any conventional over-bound tape sewing head or the special, Union *Sew-Straight* sewing head attachment (only $60!). With this attachment you sew with an "E" head in a perfectly straight line 1" below the top of the bag—and at *no reduction of filling speeds!* This straight line, controlled sewing enables you to use up to a 3" shorter bag.

Uniform bag appearance

Union's SEW-STRONG construction for Open Mouth Multiwalls results in a top closure identical in appearance to the bottom closure . . . a perfect pillow-shaped bag without long ears . . . a bag that handles better—warehouses better—merchandises better. When both Sewn Valve and Sewn Open Mouth Multiwalls are used, filled bags have similar appearance.

Write for samples of these new bags today.

For sample of new SEW-STRONG Open Mouth Multiwall

Union Bag-Camp Paper Corporation
Multiwall Division, 233 Broadway
New York 7, N. Y.

Please send free sample of the newly developed Union SEW-STRONG Open Mouth Multiwall.

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COMPANY .....

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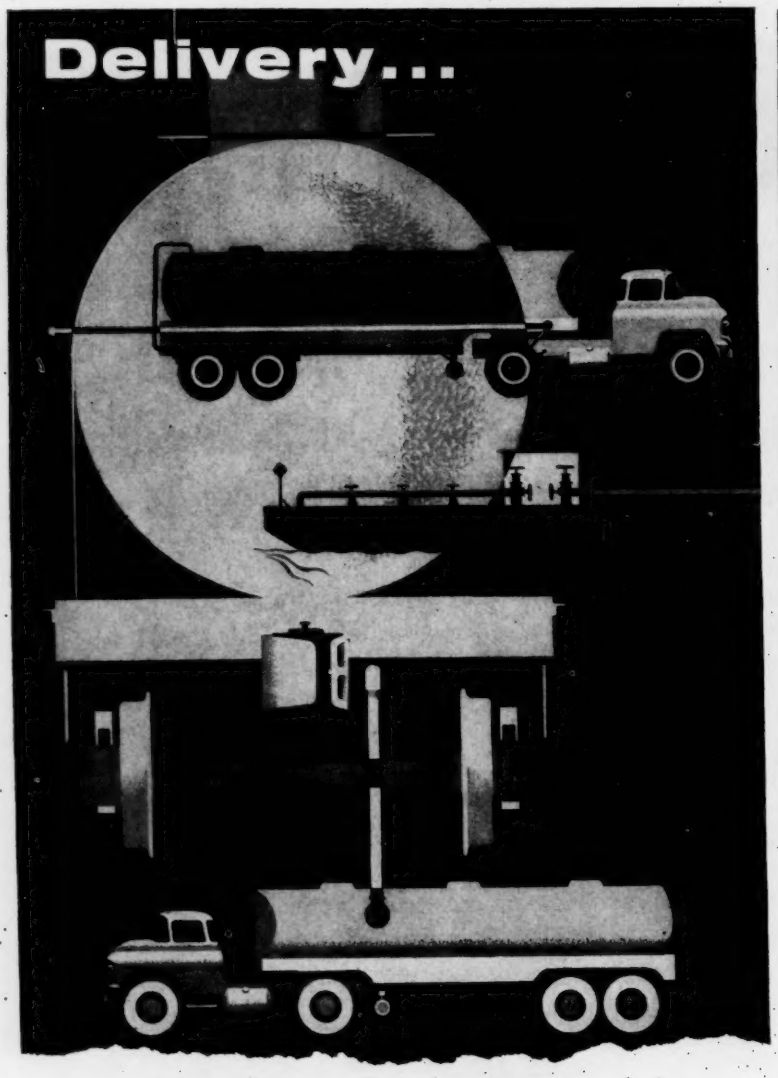

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Your order isn't properly filled until the material is in your storage tanks or yard, on time and in the form best suited to your operations. That's why so many users of coal tar aromatic hydrocarbons have come to rely on Koppers for their yearly supply.

Through years of experience in the field, Koppers knows full well the importance of delivery to successful production . . . can plan with you for shipments timed to keep your process on stream.

There's a Koppers Coal Chemicals Specialist near you who will be glad to study your aromatic hydrocarbon requirements and suggest the grade of benzol, toluol, xylol or solvent naphtha best suited to your process. These chemicals are available in tank car, tank truck and barge quantities. For further information, write Koppers' Tar Products Division, Pittsburgh 19, Pa.

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KOPPERS

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methods used by a valuation firm that set the assessments, said that the fair-return factors used are "an issue for the future, not now." The fair-return system, though not widely used, has been called legal by Texas courts.

Unity Saves Plant

In an example of unusual cooperation between labor and management, Oil, Chemical & Atomic Workers Local 15-12058 and The Carborundum Co. last week agreed on terms of a contract that clears the way for the firm to continue expanding at Niagara Falls.

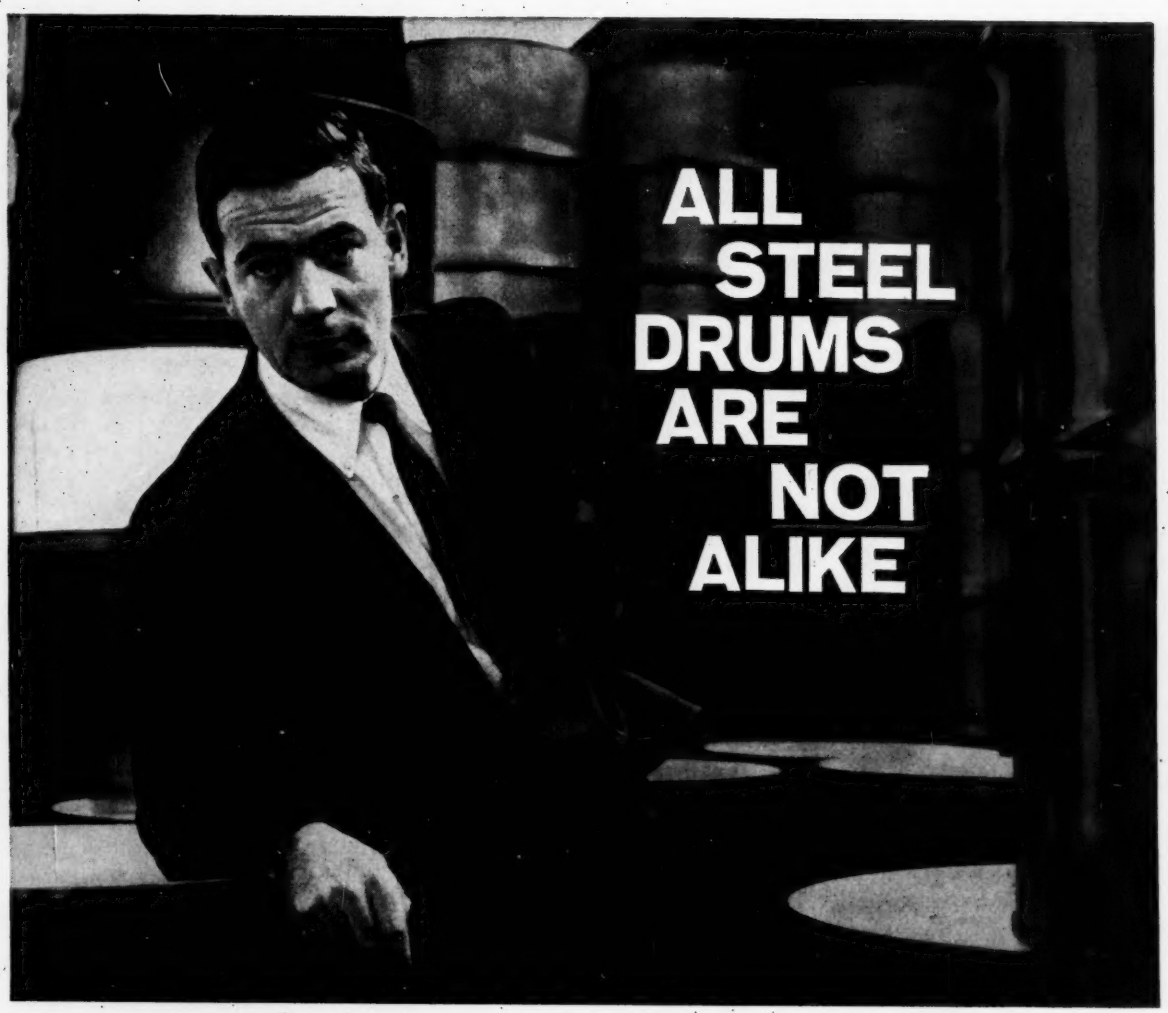
When Carborundum announced plans to rebuild a $10-million vitrified abrasive wheel plant at Van Wert, O., union leaders asked the firm's president, Clinton Robinson, what the union could do to get the company to build in Niagara Falls instead. Robinson went before the union, outlined the company's requirements *(CW Business Newsletter, June 14)*.

Contract Terms: Here's what they worked out: The new contract will be a five-year agreement, with a three-year reopener on wages, holidays and vacations, but with a no-strike clause in full force at all times. There will be no increase in base rates, nor any automatic improvement rate increases, as covered in the old contract. Pensions benefits, life insurance, hospitalization and cost-of-living formula will be liberalized. The piece-rate system will be gradually eliminated; and group incentives will be installed, whereby employees share in reduction of labor-material costs. New jobs will be on a day-work basis. New provisions on seniority, overtime, temporary assignments and bidding allow greater flexibility in job assignments.

LEGAL

Alcoa Pollution Trial Ends: A 15-week, $2.8-million damage suit against Aluminum Co. of America has ended with awards totaling $59,073 to 42 Blount County, Tennessee, farmers.

The trial, which began April 7 *(CW, Jan. 4, p. 26)*, resulted from suits brought in '55 in U.S. district court (Knoxville) by 164 farmers and farmers' groups. All claimed that fluoride fumes from the company's Alcoa, Tenn., smelting plant damaged their crops and livestock. Dur-



Now, from U. S. Steel, you get maximum product protection plus two important purchasing advantages—at no extra cost

Chemically cleaned, then coated with extra zinc phosphate – every rust-inhibited U. S. Steel drum gives you maximum product protection.

But that's not all.

With every U. S. Steel drum *and* every U. S. Steel pail, you automatically get two extra purchasing advantages that can help you save time and money.

1. Full, complete line. U. S. Steel offers today's widest selection of steel shipping containers. From 2½-gallon pails through 57-gallon drums – *plus* a complete line of stainless-steel containers. This wider line allows you to fill all your needs at one time, in one place, with absolute confidence.

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2. Punctual deliveries. U. S. Steel's seven convenient plants assure you of a smooth, even flow of containers—by rail, or in a special fleet of trucks. Our kind of service helps reduce both inventory and production problems. Your normal needs are filled without delay, rush orders get there quicker, too.

Maximum protection, simplified purchasing, punctual deliveries—U. S. Steel gives you all these extras at no extra cost. Why don't you talk over your steel shipping container requirements with the man from U. S. Steel?

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PROOF OF U. S. STEEL PROTECTION! Both these 55-gallon drums were weathered for 12 months. Rust appeared on the ordinary drum the first week. U. S. Steel rust-inhibited drum—coated with zinc phosphate—shows no trace of rust whatever.

United States Steel Products Division

USS

america's first self-sustaining nitric acid plant

Atlas Powder Company's new 250 ton-per-day self-sustaining nitric acid plant located at Joplin, Mo.

Recently completed for Atlas Powder Company, this new nitric acid plant is now producing 250 tons-per-day at the lowest cost in history. After start-up, C & I's revolutionary design produces enough steam coupled with the energy from the exhaust gases to run the entire plant without any outside source of power.

Here's what the Atlas people have to say about this new C & I installation. "This plant was started up on May 6, 1958, and during this first test run it operated as designed from a standpoint of capacity and self-sufficiency with indications of an excess of steam."

Newest of the many C & I-built nitric acid plants giving guaranteed performance throughout the world, the Atlas installation is unique in its super efficiency. If you are considering nitric acid or expanding your present facilities, it will pay you to consult C & I for only C & I has the know-how and experience to build money-saving, self-sustaining plants of this type.

Send for complete information and descriptive literature, today.

A portion of the compressor room showing the Brown-Boveri expander turbine and centrifugal compressor.

Primary drive for the compressor—G E steam turbine.

designed and constructed by

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nitric acid • phosphoric acid • ammonium nitrate • complex fertilizer • ammonium phosphate

ing the trial, 87 allegedly damaged farms were inspected by the jury.

The jury (nine men and three women) decided Alcoa was liable in some instances for fume damage from '52 to Aug. '55. (The company installed a filtering system in '55.)

Attorneys for the farmers moved immediately for a new trial, and Federal Judge Robert Taylor said he shortly will set a hearing on arguments to support the motion.

•

Battery Additive Battle on Again: In a precedent-setting blow for individual rights, U.S. House of Representatives has passed a resolution giving Jess M. Ritchie the right to go before U.S. Court of Claims in an effort to recover some of the money he spent defending his product and practices before Federal Trade Commission (*CW, June 2, '56, p. 29*).

Ritchie heads Pioneers, Inc. (Oakland, Calif.), manufacturer and distributor of battery additive AD-X2, reported to prolong lead acid storage-battery life.

The House resolution requires Court of Claims to hear Ritchie's case and submit its findings to Congress. If the findings support the additive maker, Congress could pass a special appropriation bill to provide compensation to him.

KEY CHANGES

William D. Wallace to director of manufacturing, Crown Cork & Seal Co. (Philadelphia).

W. Adrian King to vice-president, Chemicals Division, Olin Mathieson Chemical Corp. (New York).

James Deshler, II, to board chairman, Minerals & Chemical Corp. of America (Menlo Park, N.J.).

Cortez P. Hackett to director of research and development, Allied Chemical Corp. (New York).

Charles A. Polachi to president, Columbian Carbon International, Columbian Carbon Co. (New York).

Robert M. Boudeman to director, The Upjohn Co. (Kalamazoo, Mich.).

John E. Bierwirth to board chairman, and **Roy F. Coppedge, Jr.,** to president, National Distillers & Chemical Corp. (New York).

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this Harflex® Polymeric Plasticizer is permanent

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Non-migratory • Fast processing • Excellent dry blending • Good low temperature properties

Used with Vinyl Chloride Polymers and Copolymers, Polyvinyl Acetate, Synthetic Rubbers, Nitrocellulose, Cellulose Acetobutyrate, Polymethyl Methacrylate.

Can be used as sole Plasticizer

physical data

100% Modulus	1320 psi
Tensile Strength	2695 psi
Elongation	338%
Hardness, Shore A	80
T_f	—17.3°C.
Flux Time	45 seconds

heat stability (180°C.)

Initial Discoloration	15 min.
Maximum Discoloration	90 min.

extraction loss

Water	0.21 %
1% Soap	3.45 %
Mineral Oil	2.10 %

migration

Lacquer, 25°C., 14 days	Very slight softening
Varnish, 25°C., 14 days	No effect
Polystyrene, 60°C., 19 days	No effect

HARCHEM produces a full line of phthalate, adipate, sebacate and polymeric plasticizers. The Harchem Division laboratories will gladly assist you with your plasticizer problems, or will supply additional data including formulation test methods and formulation suggestions for any Harflex Plasticizer.

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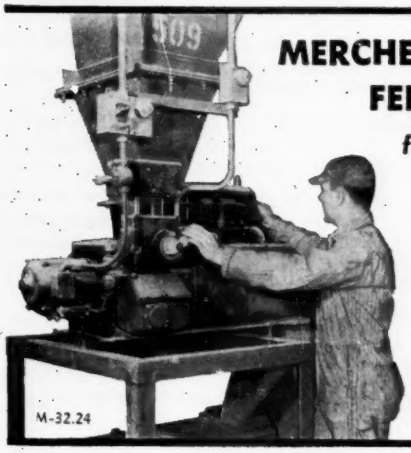

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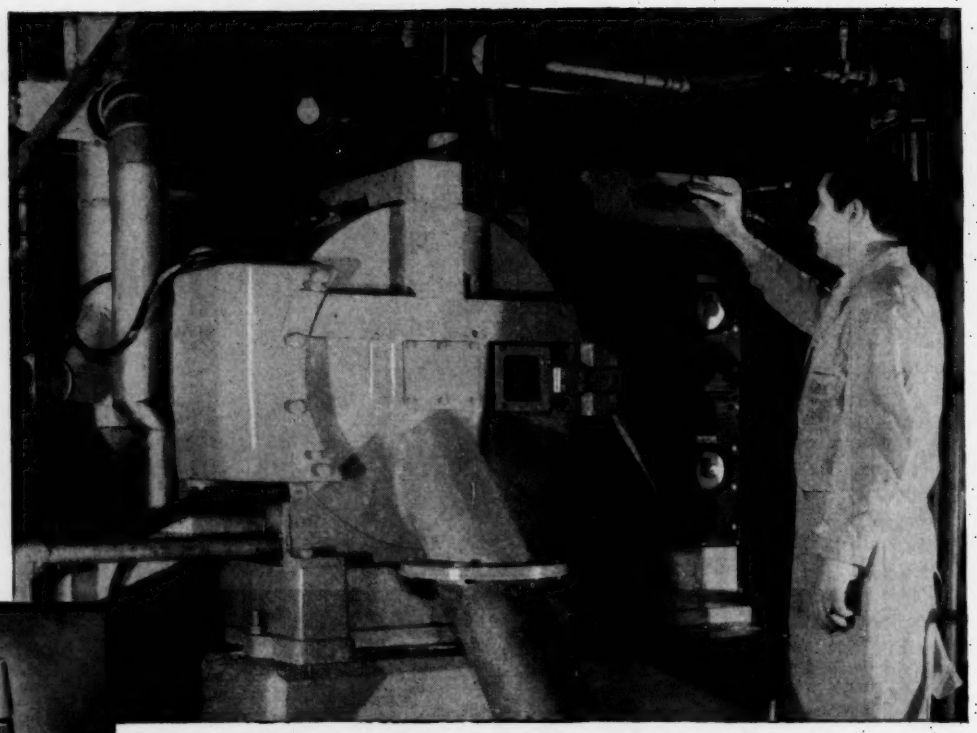
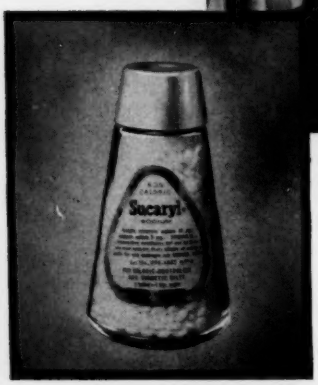




ABBOTT LABORATORIES finds BAKER PERKINS HS Universal Filtering Centrifugal cuts costs and maintains high product quality of SUCARYL

Since installing a Baker Perkins Centrifugal, Abbott Laboratories of North Chicago, Ill., has been able to triple its separation rate in the production of Sucaryl, its popular non-caloric sweetener. The B-P Type HS-20W Centrifugal now gets the same production in 8 hours that required 24 hours in the two center-slung centrifugals that it replaced. Since the centrifuge is totally enclosed, a high product quality has been realized. Operating on a 3 minute cycle, it produces a uniform moisture content crystal (18-20 per cent moisture) from a slurry containing 60 per cent solids. This uniform moisture is considered very important in the subsequent drying operation. As in the case of Abbott Laboratories, Baker Perkins centrifugals mean unsurpassed efficiency and economy . . . B-P centrifugals are built in a wide range of sizes and types, so whatever your needs may be, there's a B-P unit to do the job. Why not have a B-P Sales Engineer recommend the proper size and type centrifugal for your application.

See our insert in Chemical Engineering Catalog for additional information.

BAKER PERKINS INC.

CHEMICAL MACHINERY DIVISION
SAGINAW, MICHIGAN

339

Pest control in private homes is important business for nation's 5,000 exterminator firms.

Exterminators Swell Pesticide Sales

Last week, some 10,000 gal. of fly-killing solution were sprayed on the 90 buildings of the Illinois State Fair Grounds. That job—handled by a pest-control operator, Sentinel Insect Control Laboratory — illustrates one of the big uses of pesticidal chemicals purchased and formulated by exterminating companies.

They buy $5-7.5 million worth each year, and their share of the market may expand 10% again this year.

The 5,000 companies in the $150-million/year exterminator business spend about 5% of their gross sales for pesticides. Most of this now goes for chlorinated hydrocarbons, but organic phosphates are grabbing a bigger share of the total as insects build up resistance to the chlorinated products.

Fumigation gases, such as hydrogen cyanide, account for negligible amounts of their total purchases. Fumigations, which comprised 75% of the operators' business before the war, now amount to only about 1%. Fumigating is dangerous, inconvenient and doesn't provide residual protection.

Buyers Choice: Pest-control outfits not only buy in quantity but also buy a considerable variety of chemicals. A survey last month by the leading organization in the field, National Pest Control Assn., showed that control operators do far more than contract insect-control work (such as the Illinois State Fair job). Many also offer termite control, weed control, lawn spraying (with insecticide and liquid fertilizers) and odor control. All these jobs require the use of specialty chemicals.

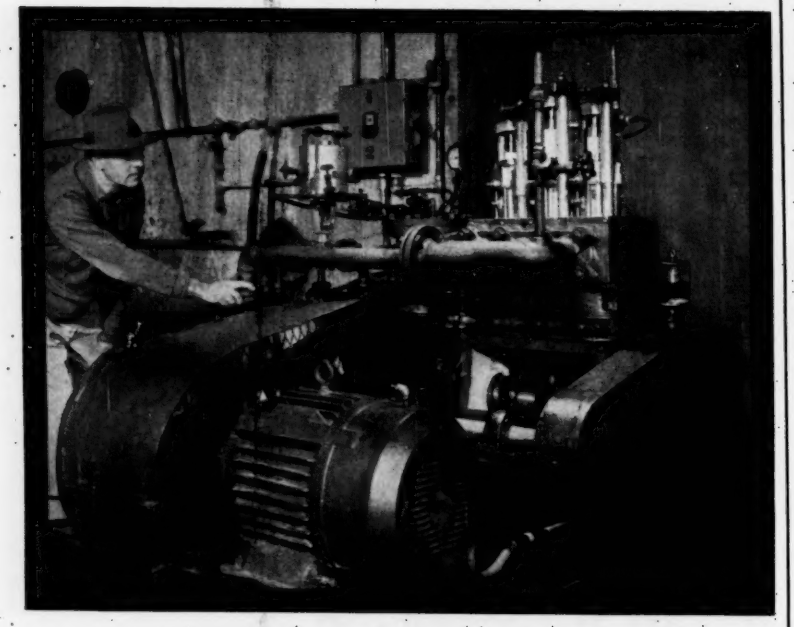
Even an exterminating firm that confines its work pretty much to insect and rodent control buys a number of chemicals. For example, Western Exterminator Co. (Los Angeles) spends $70,000/year for chemicals to service the 14,000 accounts on its monthly service list:

- Chlordane—about 10 tons/year of a 5% powder—control of ants,

JACQUES WOLF & CO. SOLVES PROBLEM:

How to maintain constant, undeviating pressure in the production of highly corrosive chemicals...

Precise, non-fluctuating pressures must be maintained in continuous processes at the Carlstadt plant of Jacques Wolf & Company. Erratic pressure caused by drop in volumetric efficiency could ruin an entire batch of costly material.



How Jacques Wolf solved the puzzle: Looking for an answer to the problem, Jacques Wolf called on Aldrich engineers to design a pump which provided the proper corrosion resistance, fluid velocity and wear characteristics to insure dependable, continuous operation.

Result: The Aldrich Triplex Pump shown above has met all guarantees. Working 24 hour days, 6 day weeks, it has maintained the precise, non-fluctuating pressures demanded by the application. It efficiently handles both alkaline and acidic materials.

We'll be glad to send you full information on Aldrich Pumps and their advantages to you. Simply write Aldrich Pump Company, 3 Gordon Street, Allentown, Pa.

the toughest pumping problems go to ALDRICH

spiders and water beetles.

- Chlorobenzilate—about 12 gal./year of 20% emulsifiable concentrate diluted in water to a 2% solution —for mites.
- Dieldrin — it is now using a 20% emulsifiable concentrate diluted in water to a 3% solution— for ants, carpet beetles, spiders.
- Roach powder — 10 tons/year of a formula containing 3% dieldrin, 3% diazinon and 0.5% parathion — this is used for control of roaches (used with DDVP).
- DDVP — about 200 gal./year in 2% solution — for roaches, fleas and some mites.
- Diazanon — 50 gal./year of 3% solution — for flea control.
- Lindane—about 1,200 lbs./year of powder — used in 0.5% solution with oil as a moth spray, and 2% solution for bedbug control.

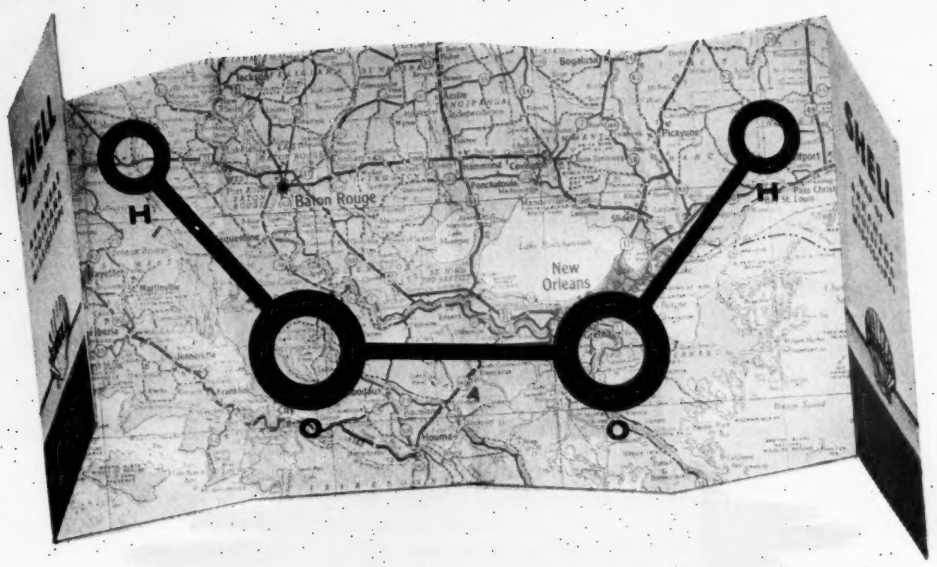
For termite control, Western uses lindane. For fumigation, it uses methyl bromide gas. No DDT is used (although the company used it widely just after the war); and malathion is used only sparingly (its odor is sometimes hard to mask).

Another Los Angeles firm, Dewey Chemical, which purchases about $40,000/year worth of chemicals for its $3-4-million operation (exclusive of termite work), uses mostly chlordane and lindane. They account for 50% of the company's total chemical purchases. Dewey uses chlordane along with dieldrin for ant control, and uses lindane as the chief agent for controlling moths, silverfish and carpet beetles. The fly problem is attacked with malathion. Mice and rats are handled with warfarin and pival anticoagulants.

Western and Dewey both are making the switchover from the chlorinated hydrocarbons, which many insects resist, to the newer organic phosphates, which have less residual power.

Backbone of the exterminator industry is the service contract, made with hotels, restaurants, taverns, markets, apartment buildings, etc. Contracts generally call for monthly inspection — treatment costs the customer around $10/month — and provide emergency calls to customers when necessary.

There's fierce competition in the industry for service accounts — so much so that companies have occa-

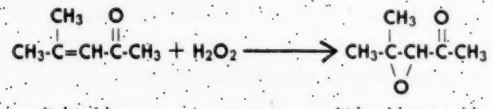


Have you tried the H_2O_2 route to epoxidation, hydroxylation, peroxidation?

CHEMISTS HAVE KNOWN for a long time that hydrogen peroxide is a practical source of reactive oxygen. Recently, its uses have expanded into new fields.

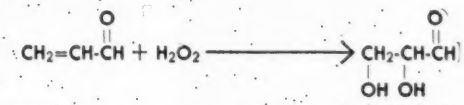
Epoxidation, hydroxylation, and peroxidation reactions, using H_2O_2, have been studied several years by Shell. Here are three examples of these routes to new products using hydrogen peroxide.

Epoxidation:



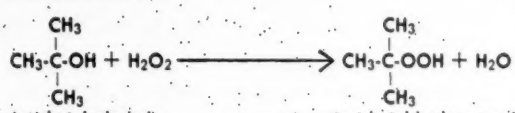
mesityl oxide ——— mesityl oxide epoxide

Hydroxylation:

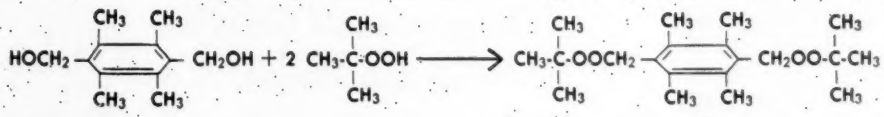


acrolein ——— glyceraldehyde

Peroxidation:



tert-butyl alcohol ——— tert-butyl hydroperoxide



bis(hydroxymethyl) durene — tert-butyl hydroperoxide ——— bis(tert-butylperoxymethyl) durene

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If you're interested in a reliable source of propylene polymers, try these new Gulf materials and see what they'll do in your process. For more information, just write or phone.

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sionally hired themselves out at fantastically low rates. In New York, for instance, one company undertook to service the Board of Education, charged them 70¢/month/school — a fraction of the cost of chemicals used.

Pest-control people are actively — but unsuccessfully — seeking contracts for servicing military installations. The industry is convinced that it could do a better job—and do it cheaper—than is now being done by the military.

Neglected Homes: Home or "spot" jobs are usually a one-time business, although there's now a trend to offer semiannual service contracts to homeowners. Most companies do not go after home contract services because of the low return; constant "emergency" service calls by customers with "bug phobia" eat up the profits. Reportedly, the suburbanite tends to call the exterminator at the first sign of trouble whereas the city homeowner tries to handle the situation himself until it gets out of hand.

Treated Wood vs. Treated Sites: Increasing suburban building has helped the home pest-control business. Slab-on-ground construction and builders' habits of leaving debris, concrete forms and other trash under basement floors and under subfloors of basementless houses have created breeding grounds for insects, particularly termites. Pest controllers are now trying to interest householders in pretreating their new homesites against termites before they start building. Controllers insist that the metal shields called for by Federal Housing Administration in its minimum service requirements are not protection against termites. One alternative is site treatment with chemicals; another is wood treatment with preservatives.

The sale of insecticides in supermarkets hasn't hurt the business of the professional exterminator. In fact it has helped him by making homeowners bug-conscious.

If a homeowner can lick his bug problem with a commercial preparation, the exterminator usually feels that the job was so small that it wouldn't have paid him to take it on. But if it's a case where an exterminator is needed, he will get the job.

Shift Toward Science: Since World War II, pest-control companies have become more scientifically operated, more willing to try new chemicals. In '45-'46, exterminators deplored DDT's advent because they felt it might wreck their business. But since then, they've sought out new chemicals.

Standards have risen rapidly, and today the pest-control operator is a

Rise of 'Otto the Rat Man'

By far the biggest in the pest control field is Orkin Exterminating Co. (Atlanta, Ga.). The company operates in 28 states, in the District of Columbia and in Cuba, and has 365 field offices. Last year's gross: $18 million.

Founder and president of the company is Otto Orkin, a 71-year-old Latvian immigrant who started in Easton, Pa., in 1901, selling paris green door-to-door to kill rats. He later moved to Richmond, Va., and his first big job there was ridding the governor's mansion of rats. Following the resulting publicity, he was asked to rid stores of roaches, so he set up a new business—Orkin Exterminating Co.

Orkin then began calling himself "Otto, the Rat Man"; and the title caught on. His entire advertising program consisted of a sales spiel painted on the spare-tire cover of his car. It was parked at Richmond's busiest intersection, Seventh St. at Broad. To induce policemen to overlook the parking violation, they were offered free exterminating service.

Orkin moved to Atlanta because of the many insect problems in the Deep South.

Among the things the company has done since its establishment in Atlanta: fumigating a 15-story Miami hotel. It involved air-tighting a million cubic feet, required three weeks' work and earned the firm $13,500.

Orkin won't reveal what chemicals or how much of them he buys, but it's *CW*'s estimate that the firm purchases $250,000-300,000 worth of chemicals annually. Atlanta headquarters keeps a stock of materials, which are bought on a three-month basis; others, on a yearly basis. Branches requisition their supplies from Atlanta, keep a three-month stock on hand.

Olin Mathieson

Fuel for tomorrow's planes

A new fuel which holds great promise of meeting the exacting demands of the U.S. Air Force has been developed by Olin Mathieson Chemical Corporation.

Olin Mathieson chose Catalytic Construction Company for engineering services and for the complete management of construction of the new plant to produce this fuel.

Catalytic's unique ability of uniting experience and technical skill with imagination is again meeting the challenge of plants for tomorrow—today.

CATALYTIC
CONSTRUCTION
COMPANY

Philadelphia 2, Pennsylvania
Toledo, Ohio
In Canada: Catalytic Construction of Canada, Limited; Sarnia, Ontario; Toronto, Ontario; Montreal, Quebec

BASIC CHEMICALS making profit news

Sometimes new developments in basic commodity chemicals are not immediately made known to potential users. But with the profit squeeze pinching budgets and dividends tighter and tighter, this advertisement (and others to follow) hopes to speed up the process of spreading good news. The news items on these two pages are designed to help you keep your finger on what is happening in the world of new uses for established, well-known chemicals—as well as keeping you up to date in the world of new chemicals.

You may wish to check certain items in this advertisement and forward to those concerned in your company.

Route to:

_____

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GLYCOL ETHERS SOLVE TOUGH CASES

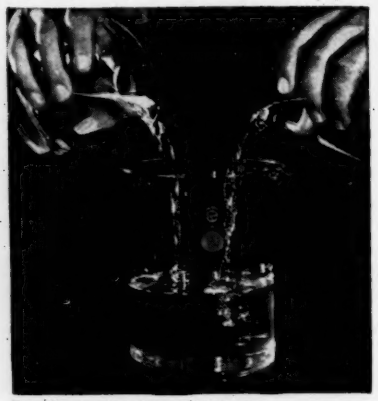
Specialized solvent problems, long a major plague of fast changing formulations, are bowing to the unusual versatility of glycol ether solvents. Dow now offers industry an ethylene and propylene series of glycol ethers (trademarked Dowanol) that promises to dissolve many headaches by saving both dollar-precious time and research-precious dollars.

A recent TV late, late movie featured a scientist who discovered the "Universal Solvent". It dissolved the universe. Dow's increasingly popular Dowanol® products aren't *that* good—but they are versatile!

They combine the best of the solubility characteristics of alcohols, ethers, and hydrocarbons. And they have a remarkable range of boiling and pour points. Small wonder they find application in many diverse areas of chemical processing. For example . . .

Take hydraulic brake fluids. Almost two tons of speeding automobile are controlled by the brake drums through the brake fluid. A recent "AAA" bulletin warned that the use of sub-standard fluids was creating a serious safety problem . . . in fact, twelve states have already legislated against it. Recent changes in car-making—increased horsepower, greater weight, automatic transmission, smaller wheels—have all combined to raise the temperature to which brake fluids are subjected.

That's where Dowanol products come in. They help manufacturers of hydraulic brake fluids to obtain formulations with a high boiling point and favorable viscosity characteristics and also hold fluid ingredients in phase over a wide temperature range.



Excellent solubility, with both organic compounds and water, marks Dowanol products as extremely versatile.

Now paints and lacquers don't blush like they used to, thanks to Dowanol. Blushing used to occur because of a deficiency of active solvent in the lacquer formulations. This would cause partial precipitation of nitrocellulose during drying. The lackluster result: dull finish and pinholing. Because of their exceptionally powerful solvent power toward these components, Dowanol glycol ethers minimize and often prevent this.

Or take "orange peel", a condition in which the surface of lacquer resembles the texture of an orange skin. Dowanol in the formulation overcomes it . . . easy as peeling an orange.

"Let Dowanol do it", is the watchword in dozens of industries that have solvent problems. Dowanol products are used by manufacturers of textiles as dye solvents, manufacturers of ink solvents, dry cleaning solvents, spotting fluids, soluble oils, rust removers, cosmetics, metal parts cleaners, liquid soap ingredients . . . in almost any product where high solvent action and low evaporation rate are essential. (An added plus: both the ethylene and the propylene series of Dowanol products have a low degree of toxicity—present no serious health hazards.)

Best proof that more and more chemists feel that Dowanol products pro-

DOW CHEMICALS basic to the chemical processing industry

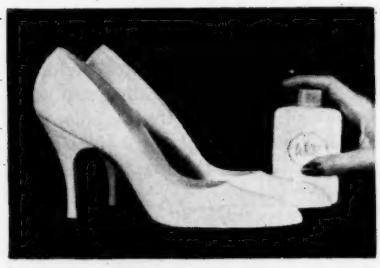
Alkylene Oxides, Glycols • Industrial Preservatives • Polyalkylene Glycols • Glycol Ethers • Alkalies • Phenolic Compounds • Brominated and Chlorinated Aliphatic Compounds • Inorganic Acids • Halogens • Organic Acids and Esters • Inorganic Chlorides, Bromides and Bromates • Nitrogen Compounds • Amino Acids • Glycerine • Salicylates • Phenyl Phosphates • Heat-Transfer Media • Flotation and Flocculating Agents • Chelating Agents • Ion Exchange Resins • Methylcellulose • Magnesium • Plastics • Aromatics

vide more and more answers to tough solvent problems is the recent announcement from Midland that Dow is doubling production of these chemicals to meet the fast growing demand.

DOWICIDE:

How white is your white?

RIDDLE: When is *white* shoe polish *brown?* ANSWER: When bacteria and/or fungi cause decomposition and color change. This actually happened to a nationally-known manufacturer of shoe polishes. After his liquid white polish was bottled for a few weeks it would turn brown—either on the supermarket shelf or in the home.



Dazzling white puts a polish on sales.

Product doctors were called in. They recommended the addition of a Dowicide® preservative to the formula. RESULT: "Color problem licked. Product now whiter than snow . . . doing just fine saleswise, too!"

Thousands of other organic compounds, polishes, floor waxes, starches, laundry products, are protected from bacterial or fungicidal breakdown by Dowicide preservatives. There is a whole family of Dowicide products . . . 14 of them, at last count, each with special properties for different protective jobs. Dow has prepared brochures that describe them and their myriad applications. The answer to a product breakdown problem might be at the other end of a phone call.

★ ★ ★ ★

For further information on these products and other Dow chemicals, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Chemicals Sales Department 751B.

YOU CAN DEPEND ON

DOW

CHLOROTHENE: *Sprays away high aerosol costs*

Today's profit-minded aerosol men praise the big "package" of advantages offered by the new solvent, Chlorothene® (Dow 1,1,1-trichloroethane, inhibited). It's tops as a replacement for propellants. Case in point: The use of Chlorothene as a vapor pressure depressant in hair sprays where it does double duty as a solvent for active ingredients; in some formulations it eliminates the need for additional solvents. In others, it serves as the "active" ingredient (as in spot-remover formulations).

Many aerosol formulators employ Chlorothene to good advantage because of its low toxicity, high stability, no appreciable fire hazard, and not unpleasant odor. Some salesworthy examples: moth-proofing, insecticide and waterproofing formulations. Best of all, it offers these quality product pluses at an actual saving in cost over more expensive fluorinated compounds!

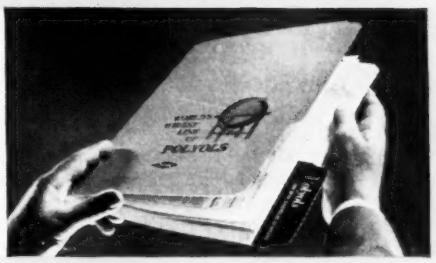
Putting **MORE PROFIT** in your products . . .

Bromine

First Dow product (1897). Vast experience in technology and production of bromine and brominated products. Result: Dow unequalled as source of supply.

Polyols

"The Men That Make the Most of Them" recommend "World's Widest Line of Polyols" folder. Details included on polyols as well as literature bibliography.



Hydrochloric Acid

Water transportation pioneered by *Marine Dow-Chem* and HCl. Vast network of terminals and shipping points assures quality product delivery on time, in time.

Ethanolamines

New booklet describes latest information on handling and storage as well as detailing improved color characteristics of Dow's triethanolamine.

Cost-cutting approach saves $6,000 on fluid mixing

An idea from your LIGHTNIN Mixer representative's briefcase

In this plant, heavy clay-and-water slurry is mixed in tall tanks. But this operation posed a big maintenance problem, because the long vertical mixer shaft in each tank had to be steadied by a bearing in the tank's bottom.

Gritty clay kept getting into this bearing and grinding it to pieces in a few weeks. Then production had to stop. The bearings didn't cost much, but the tab for replacing them was ruinous.

Finally a LIGHTNIN Mixer representative explained how this company could easily mix uniform clay suspensions in its tall tanks—with a *side entering* LIGHTNIN Mixer like the one you see here.

Now there's no maintenance headache, because no steady bearing is needed; so production keeps moving. Also, it costs *$6000 less* to install one of these LIGHTNINs than it would cost to replace the older mixers. And this company reports its clay suspensions are much more uniform than before.

What this man can do for you

This is just a sample of the cost-cutting approach to mixing that you get from your LIGHTNIN representative.

He can help you avoid engineering headaches, too, because his recommendations are based on unique MIXCO pilot-run data guaranteed accurate.

Take advantage of his unmatched experience by calling on him for prompt help on every fluid mixing operation. You'll find his name in Chemical Engineering Catalog. Or write us direct.

Lightnin® Mixers

MIXCO fluid mixing specialists

MIXING EQUIPMENT Co., Inc., 148-h Mt. Read Blvd., Rochester 11, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Avenue, Toronto 10, Ont.

SPECIALTIES

far cry from his prewar counterpart. Helping advance the standards:

- Thirteen states now require licensing for pest-control operators. And licensing is usually obtained by passing a state-supervised exam.
- Schools are offering short courses in the subject of pest control. Purdue is offering a four-year course to train future operators.
- National Pest Control Assn. has become a strong organization, has enthusiastic supporters. It publishes technical literature for its members and helps members with their formulation problems.

The outlook is for continued success for the exterminator industry. People have found that they can whip some of the pests that invade their homes and their places of work, and this has made them eager to chase out others.

The resistance of insects to presently used materials doubtlessly means that more industries, municipalities, building operators and homeowners will turn to pest-control experts —and any boost in their business will mean more sales of chemicals.

PRODUCTS

Labelers' Manual: The Chemical Specialties Manufacturers Assn. has just published its "Compilation of Labeling Laws and Regulations for Hazardous Substances," a 114-page book that includes the laws in 16 states and cities as well as the Federal Caustic Poison Act and the CSMA "Model Hazardous Substances Labeling Act for Retail Packages." Price: $5/copy.

•

PVC Stabilizer: Ferro Chemical Corp. (Bedford, O.) is now offering a new nontoxic stabilizer for use in polyvinyl chloride food packaging materials. Ferro 763, Approved by U.S. Food & Drug Administration, it's recommended for calendering, extrusions and plastisols. The pasty, white compound has a specific gravity of 1.0 and a bulking value of 0.175 gal./lb. It can be used at operating temperatures of 365 to 385 F; other Ferro stabilizers (707X and 760X) cannot.

•

Polyamide Resin: Versamid 140, a polyamide resin, has been added to the product line of the Chemical

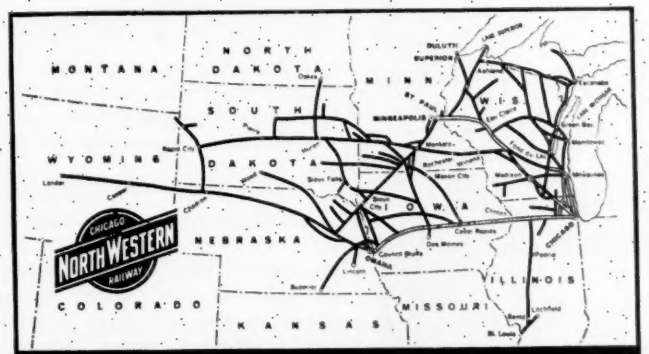
GUESS WHO

threw the overalls in the plant site chowder?

Not sweet, lovable Susie Q.? Well, not exactly. It all happened when Susie's Dad was appointed manager of a new plant. Then when Mrs. Q. asked where Susie would go to school, Mr. Q. said he *thought* the nearest school was eight miles away. Down went Mrs. Q.'s foot. Loss to the new plant: one brilliant manager.

Basic trouble here was, company management, busy with construction plans, neglected "minor" details such as schools, churches, shopping facilities, home availability and community reception of the new plant.

It's an example of the many considerations in the selection of the "right" plant site. One sure way of reducing the factor of oversight is to consult with North Western's Industrial Development Department *before* selecting a location. Accurate, up-to-date information on plant sites is our business. Experts in many fields, such as legal, marketing, labor, public relations, engineering and transportation furnish detailed, authoritative facts on the best sites in nine states. Why not use North Western service . . . there is no obligation!



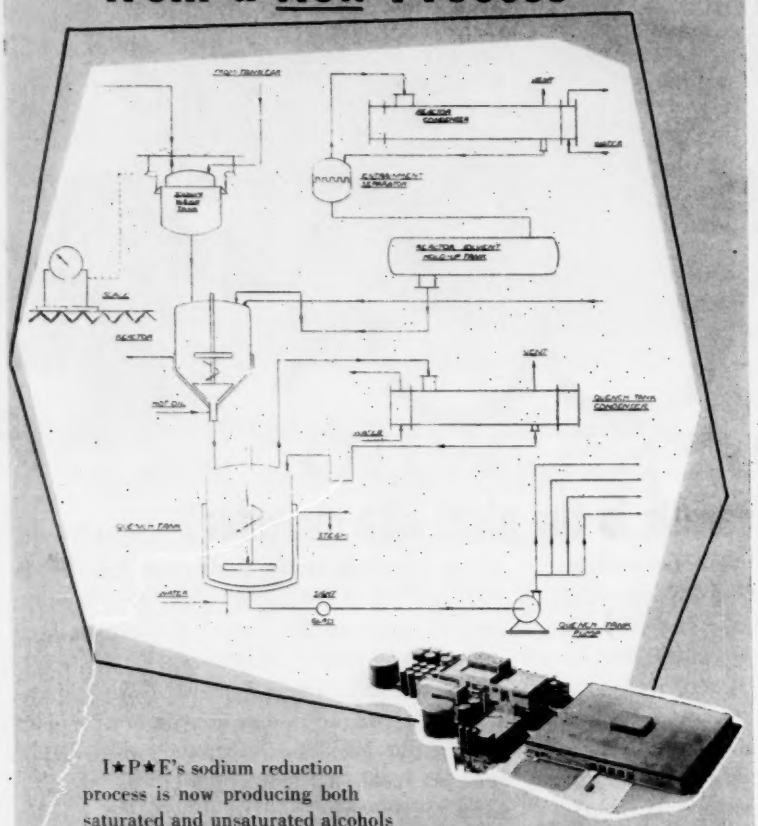
North Western serves industry in nine great Midwestern states

Address: GENE F. CERMAK
Director of Industrial Development
Chicago and North Western Railway
400 W. Madison Street
Chicago 6, Illinois

CHICAGO AND NORTH WESTERN RAILWAY

New Fatty Alcohols

from a New Process



I★P★E's sodium reduction process is now producing both saturated and unsaturated alcohols that have never before been commercially available. The flow sheet shows the principal equipment in the reactor system, which is designed for maximum safety, as well as efficient operation, high yields and product flexibility. Plants are designed for large volume runs of a variety of oils, as well as for semi-commercial and pilot batches of special oils.

For further details on this process, or any fatty alcohol plant, contact I★P★E's Process Plants Division, Dept. C.

I·P·E® PRECISION ENGINEERED DESIGN

INDUSTRIAL PROCESS ENGINEERS

12 LISTER AVENUE • NEWARK 5, N. J.

SPECIALTIES

Division of General Mills (Minneapolis). It's an epoxy-reactive polymer and designed particularly for adhesive, potting and casting, tooling, and laminating applications.

•

Antirust Paint: Paramount Industrial Products Co. (Cleveland) has introduced an antirust paint that it says can be applied over damp metal surfaces. It's called Apex Black and is recommended for use on all exterior and interior metal surfaces, including pipes, gutters, fire escapes. It's available in black, red, gray, green and aluminum (the latter without a moisture-penetrating vehicle).

•

Based on Neoprene: The equipment division of Crichton Co. (520 Vine St., Johnstown, Pa.) has introduced a new line of neoprene products tradenamed Crico. Included in the line: a liquid sealer, a brush-on weatherproofing material and a caulking compound.

•

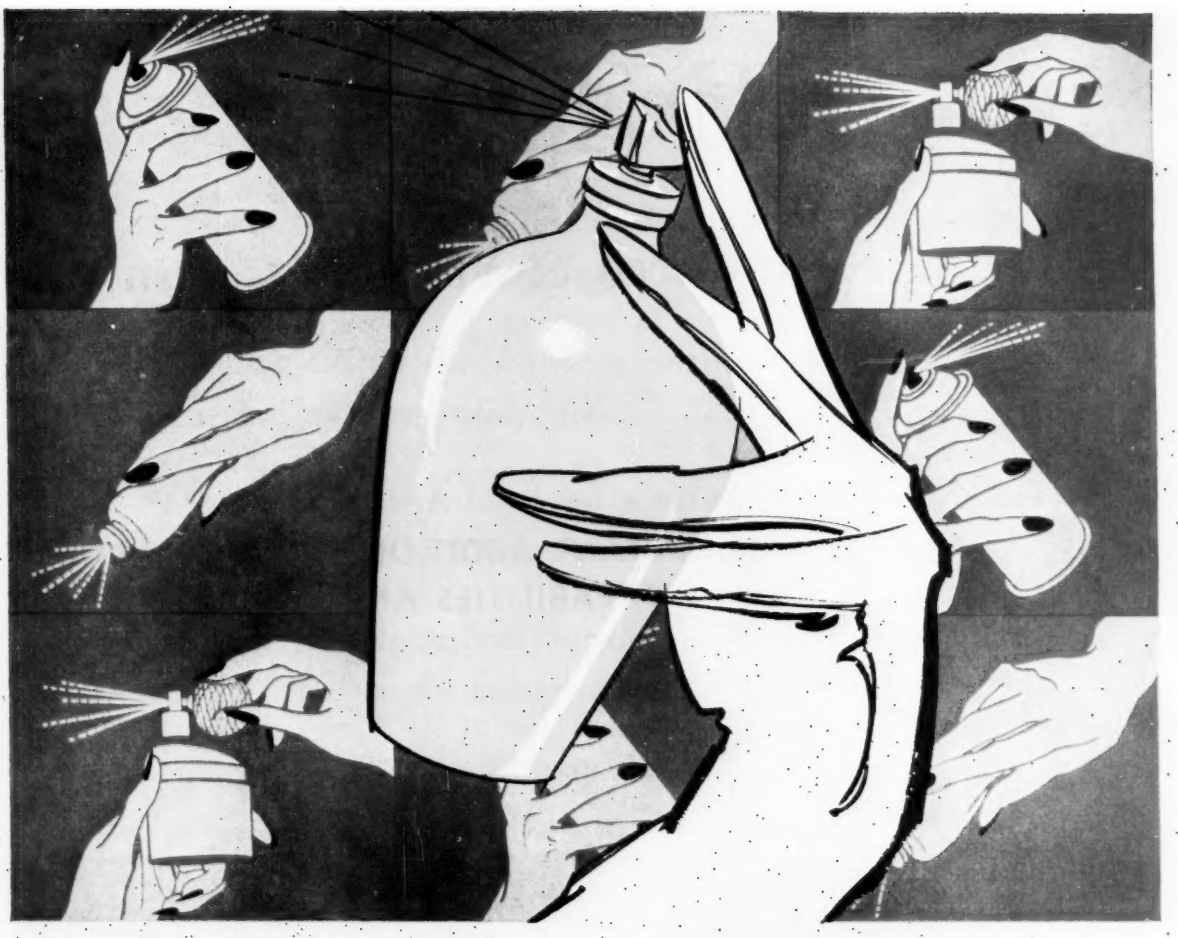
Cationic Line: American Alcolac is going into commercial production of a new line of cationics. Chemically they are alkyl dimethyl benzyl ammonium chlorides, ranging from C_8H_{17} to $C_{18}H_{37}$. Among the Siposans (Alcolac's tradename for the line) currently available is a homogeneous product that is substantive to the hair, is specifically designed for cream hair rinses.

•

Water-Treating Resin: National Aluminate Corp.'s (Chicago) latest cation-exchange resin, Nalcite HCR-W, is said to have greater physical stability than has ever been attained in a cation exchanger. It's particularly designed for use in hot-lime zeolite water-treating plants—operating temperatures as high as 250 F do not affect stability or capacity.

•

Hair Spray Resin: Ciba Co. Inc. (New York) is now marketing a low-viscosity resin solution that it claims brings unique hygroscopic and thermal properties to the hair fixative field. Hair treated with formulations based on the new acrylic, Base 325, can be restyled without removal of the fixative, simply by wet-combing the hair and then resetting it, says Ciba. Ciba supplies 325 as a 50% solution in ethonal with a maximum water content of 0.9%.



A way to make sprays soothe the skin

A little glycerine in aerosol sprays adds soothing action on the skin. It moistens, softens and maintains fluidity. Miscibility with propellants is obtained with common co-solvents such as ethyl or isopropyl alcohol—all at low cost!

Glycerine offers an unique balance of properties for toilet goods and pharmaceuticals. For example, it controls body and consistency, lubricates, prevents settling, resists hardening, prolongs product life. Its safety, compatibility and acceptability are difficult to match in any other chemical.

Glycerine is stable in price, dependable in supply. Its usefulness continues to grow. We'd like to send you our 18-page booklet: "Glycerine Properties and Uses." Address your request to the Glycerine Producers' Association.

Properties

HYGROSCOPICITY • STABILITY

SOLVENT POWER • VISCOSITY

NONVOLATILITY • NONTOXICITY

TASTE • COMBINING WEIGHT

ADVANTAGES THAT COME WITH . . .

Glycerine

Applications

HUMECTANT • CARRIER

SOLVENT • LUBRICANT

SOFTENER • EMOLLIENT

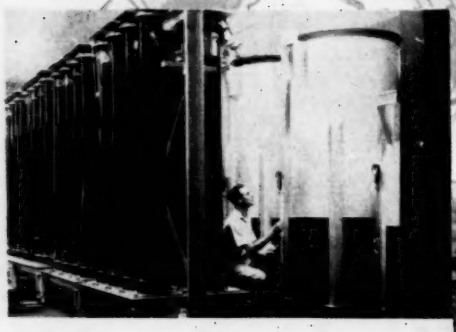
ANTI-FREEZE • ALKYD BASE

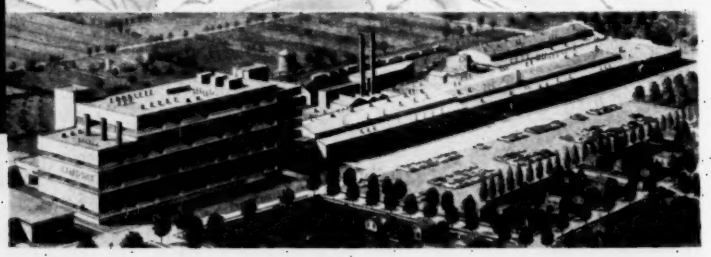
GLYCERINE PRODUCERS' ASSOCIATION • 295 MADISON AVENUE, NEW YORK 17, N. Y.

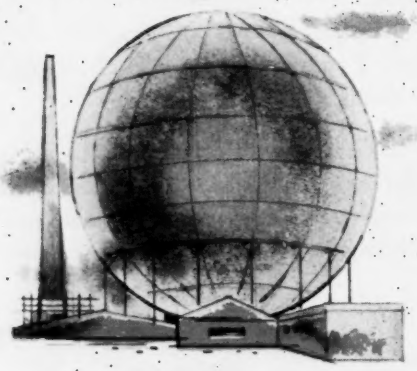
LINDSAY

Thorium, Rare Earth & Yttrium Chemicals

IMPORTANT ADDITIONS TO TRONA'S* CAPABILITIES AND SERVICE







The merger on May 1, 1958, of Lindsay Chemical Company into American Potash & Chemical Corporation joined two pioneering names already in the forefront of new chemical technology. Lindsay is the largest known producer of thorium, rare earth, and yttrium chemicals. Their greatly expanded production facilities have made these materials available at *dramatically reduced* prices in gram to carload quantities. The enormous potential of Lindsay's products – with applications in carbon arc lighting, reactor control materials, optical products, glass, textiles, paints, high temperature alloys, and many other areas – reflects American Potash & Chemical Corporation's traditional policy of expanding its service to Industry. Lindsay's products supplement AP&CC's lithium, boron, cesium, rubidium, and other new chemicals now available. Years of accumulated experience by the Lindsay division's technical staff is at your service. Let us show you how this experience can aid you in your process or new product development. *Address inquiries to:* LINDSAY CHEMICAL DIVISION, American Potash & Chemical Corporation, West Chicago, Illinois.

TRONA

American Potash & Chemical Corporation

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99 PARK AVENUE, NEW YORK 16, NEW YORK

SALES OFFICES: LOS ANGELES, NEW YORK, CHICAGO, SAN FRANCISCO, PORTLAND (ORE.), ATLANTA, COLUMBUS (OHIO), SHREVEPORT

*Tradename and trademark AP&CC

LANTHANUM • RARE EARTH CHLORIDES • CERIUM OXIDE • THORIUM • DIDYMIUM • YTTRIUM

"The switch from single-craft to multiskilled mechanics has improved our maintenance efficiency 20%"

"A multiskilled mechanic is more valuable to us—and more valuable to himself, too."

"Multiskilled mechanics are all right, up to a point—but you can't be both jack and master of all trades."

"We'd like to adopt multiskilled practices at our plant, but the union is against it."

"Our own maintenance foremen are against multiskilled mechanics, more so than the unions."

Multiskills—Multiposer for Maintenance

Whenever top maintenance management meets these days there's almost certain to be discussion of the big switch under way in process industry maintenance practices — the change from single-craft to multiskilled mechanics. And the above quotes from a just-completed CW survey of that trend explain why some plants make the switch and others refuse.

At first glance, the pros and cons of multiskill setups seem split along strict management vs. labor lines — management for multiskills and labor against. But as more and more firms change over, the management-labor argument often takes a back seat. Basically, the question is efficiency. And maintenance management at some plants isn't convinced that a multiskill system has clear-cut advantages for their plants.

Esso Standard Oil Co.'s Bayonne, N.J., refinery reports a 20% over-all improvement in maintenance and construction operations as a result of adopting a multiskill plan. But some companies found that they actually lost efficiency, had to backtrack to a partly single-craft system.

What are the factors that determine whether multiskill operation is feasible? Here are some of the considerations, turned up in *CW*'s nationwide check:

Size and Specialization: Plant size has long been one of the most important determinants. Some small plants have had only two major job classifications — operators and mechanics — for many years. Says one plant manager, "Our staff isn't large enough for a setup along craft lines. In fact, when a process unit is down, we expect the operators to assist in general maintenance tasks."

Another factor concerns the type of operation. Automated processing in recent years has brought many managers around to the multiskill theory. For example, Du Pont's Engineering Service Division seven years ago developed a basic maintenance training program that stresses multiskills. It was convinced that in the automated plant results would be more effective if a mechanic serviced a process rather than a single specialty (*CW, June 29, '57, p. 64*).

Although changing operations seem to call for multiskill systems, it is not always possible to try it. At a recent maintenance clinic, representatives of several chemical firms indicated that they would like to replace single-craft organizations with multiskilled ones, but were afraid that union problems might arise.

Said one maintenance superintendent: "There is no doubt that in many plant areas a multiskill setup would be advantageous. Most of the work around the plant is of an unskilled or semiskilled nature and jacks-of-all-trades could do these jobs. It would be more efficient — we wouldn't have to wait around for each craft mechanic to do his particular part of the job. And we'd save money and need fewer men." Another plant,

TC
TENNESSEE CORPORATION

INDUSTRIAL CHEMICALS

We mine Copper, Sulfur, Iron and Zinc and are basic producers of their chemical derivatives. Our technical know-how and basic position in these minerals is your assurance of exacting quality control, strict uniform consistency and a plentiful supply.

COPPER

COPPER SULFATE
CUPRIC CHLORIDE
MONOHYDRATED COPPER SULFATE
CUPRIC OXIDE
COPPER CARBONATE

SULFUR

SULFURIC ACID
SODIUM HYDROSULFITE
LIQUID SULFUR DIOXIDE
PARA TOLUENE SULFONIC ACID, ANHYDROUS
CHLOROSULFONIC ACID

IRON

FERRIC IRON SULFATE

ZINC

MONOHYDRATED ZINC SULFATE
ZINC OXIDE

MANGANESE

MANGANESE SULFATE
MANGANOUS OXIDE
MONOHYDRATED MANGANESE SULFATE

Samples, specifications and detailed information upon request.

TC
TENNESSEE CORPORATION

TENNESSEE CORPORATION
617-629 Grant Building, Atlanta, Ga.

for example, reports a 37% reduction in maintenance personnel as a result of multiskill practices. This is the unions' strong point of contention.

"In small plants you have to be realistic and combine crafts, of course," says a union official. "But in large plants there is plenty of craft work available for craft lines to be maintained."

One plant official, however, minced no words in suggesting that craft lines make it difficult to reduce the work force: "Our industrial relations department is almost continually troubled by feather-bedding attempts of the union."

Give to Get: Some companies that have installed multiskill systems, however, report surprisingly little union opposition in the plants. "You have to give something in order to get something," managers say.

One firm has "given away" its job-classification ratio. Now, all qualified mechanics receive first-class mechanic status and pay. They no longer must remain second- or third-class mechanics until there is an opening at a higher level. Another plant simply boosted its mechanics' pay when it introduced the multiskill system.

Some unions realize multiskilled mechanics have greater job security —a man becomes more valuable to the company and he is less likely to be affected when single-craft needs change. Furthermore, if a shift to the multiskill system is made, the single-craft mechanic has the opportunity to learn new skills at company expense — skills that should make him more valuable in the labor market if he is laid off.

Nevertheless, some unions contend that multiskill systems handicap older workers at long-established plants. Says an official of one union: "Take an older craftsman — he's spent years in learning a craft well. Then he's given a limited time in which to acquire proficiency in a new craft; and if he doesn't acquire it, he's dumped out."

Some plants have encountered similar opposition from their older foremen. "Most of these foremen are respected, have been consulted about their specialty for years. They resent what they feel will be a lessening of their prestige," says a plant manager of a Midwest company.

Master of None: Some plants look askance at multiskill systems, claim that, in addition to a lessening of prestige, there is also a dilution of skill. "The best work is done by a specialist," says one plant manager. "Multiskill mechanics can't help but turn out sloppy work," says another.

But even plants that have multiskill systems recognize this danger. Many expect their multiskill mechanics to retain a specialty they will perform about 75% of the time. For example, if a mechanic has a rigging specialty, an attempt is made to assign him to jobs that call primarily for a skilled rigger. "But we also expect him to do any pipefitting, etc., that goes along with the job. If there is a question of safety or special skill for some small part of the job, a mechanic with a primary skill in that particular phase is called in," explains a maintenance superintendent.

Instrument men and electricians have generally been exempt from learning other skills, have maintained their single-craft status. And some plants have also found that a top-notch machinist can't perform other tasks and still retain his machinists' skill. Another exception are "code" welders, who must practice continually to qualify for code status.

Several Systems: Plants that have multiskill setups operate under either of two systems. In one, the plant is zoned, and each area has its multiskilled mechanics; but the central shops maintain their single-craft setup, handle major new construction jobs. In the other system, the central shops as well as the plant zones have multiskilled mechanics.

There are also supervision variations in these plants. Some have area supervisors; each is expected to oversee all mechanical work in his area. One company, before going to the area supervisor plan, set up a system that reduced the numerous craft groups to four general groups of related crafts. Each group had a supervisor.

But at one plant, efficiency dropped because of area supervision. The plant decided to retain multiskill mechanics but to go back to craft supervision.

Other plants have retained single-craft mechanics but have established a multicraft supervisory setup. An example is Tidewater Oil Co.'s Avon,

Speed new product marketing...cut capital outlay

Investigate Eastman's Custom Processing Plan

for commercial-scale organic reactions

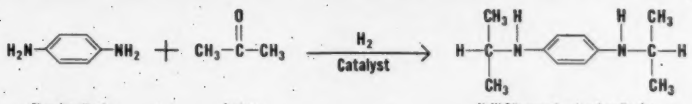
Eastman is performing a wide range of commercial organic reactions on a contract basis for companies seeking to postpone or avoid new capital investment or time-consuming process development. Some of the products are intermediates for further processing by the contracting company. Some are finished chemicals ready for marketing.

If your present or future plans include reactions in those fields of organic chemistry represented in the accompanying table, write or call our Custom Processing Department for specific information. By taking advantage of Eastman's specialized equipment and extensive experience in carrying out such reactions on a commercial basis you can—

1. avoid tying up capital in costly, special-purpose, or infrequently-used equipment
2. speed the commercial manufacture of new products
3. save on engineering design and process development costs
4. avoid handling certain unstable or hazardous reactants.

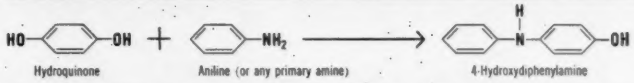
These reactions represent those fields of aromatic organic chemistry in which Eastman is particularly qualified. Numerous aliphatic reactions, including acetylations, aldol condensations, anhydride formations, dehydrations, dehydrogenations, esterifications, hydrogenations and oxidations are also performed on a contract basis.

REDUCTIVE ALKYLATION



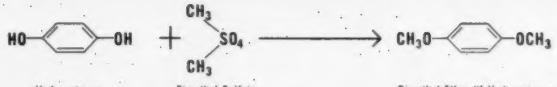
p-Phenylenediamine — Acetone — N, N'-Diisopropyl-p-phenylenediamine

AMINATION



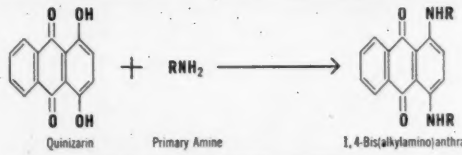
Hydroquinone — Aniline (or any primary amine) — 4-Hydroxydiphenylamine

ETHERIFICATION OF PHENOLS



Hydroquinone — Dimethyl Sulfate — Dimethyl Ether of Hydroquinone

REACTIONS OF ANTHRAQUINONE DERIVATIVES

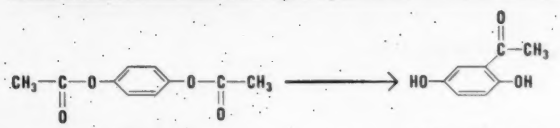


Quinizarin — Primary Amine — 1,4-Bis(alkylamino)anthraquinone

ALKYLATION OF PHENOLS

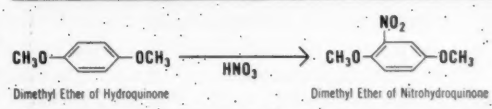
p-Cresol — Isobutylene — 2,6-Di-tert-butyl-p-cresol

FRIES REARRANGEMENT



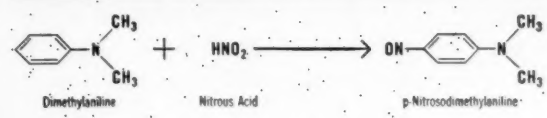
Hydroquinone Diacetate — 2', 5'-Dihydroxyacetophenone

NITRATION (ANY POSITION)



Dimethyl Ether of Hydroquinone — Dimethyl Ether of Nitrohydroquinone

NITROSATION



Dimethylaniline — Nitrous Acid — p-Nitrosodimethylaniline

Custom Processing Department
Chemicals Division

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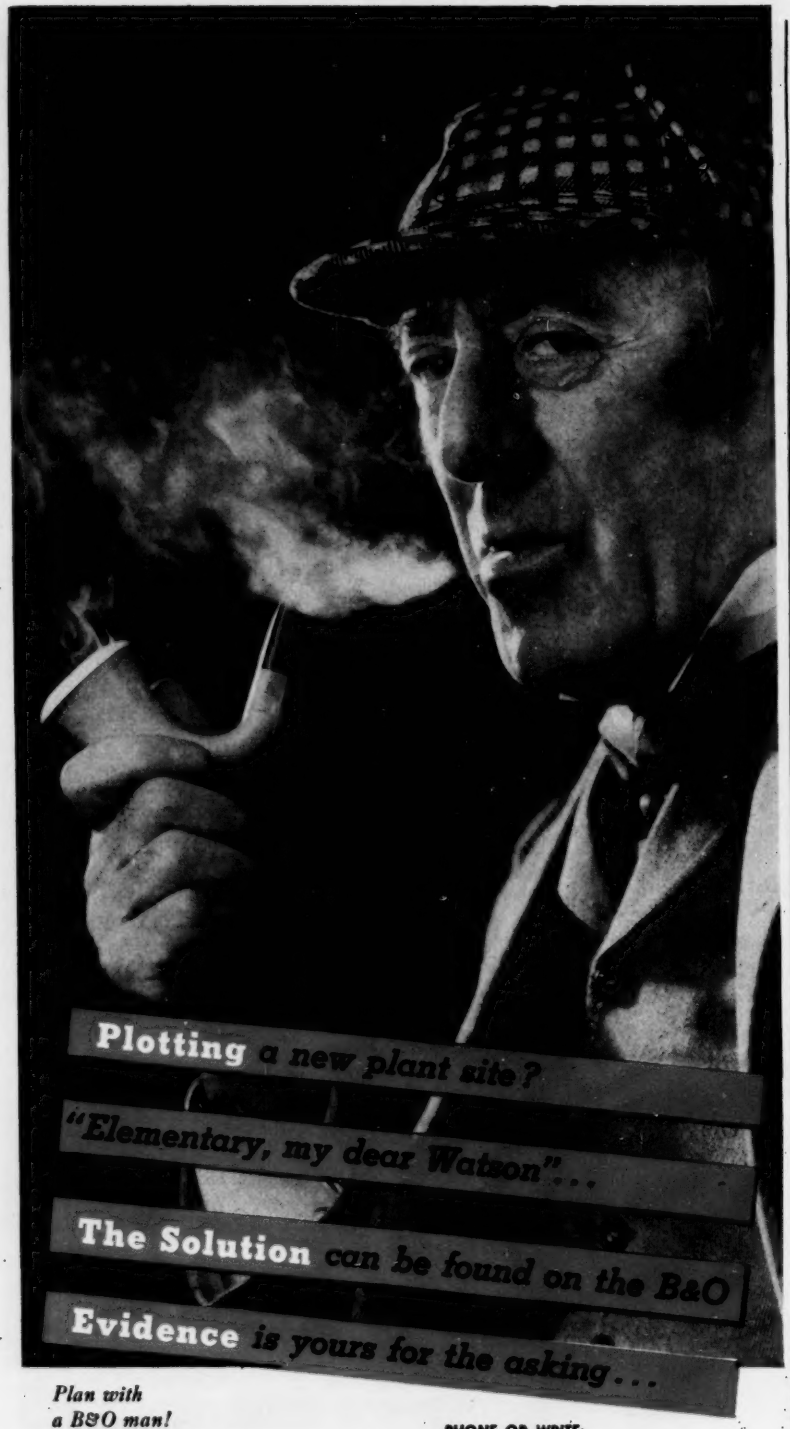

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PRODUCTION

Calif., refinery, where three geographical areas have been set up with multicraft supervisors. Each area has been subdivided into three zones, each with a multicraft zone supervisor. But craft supervisors and single-craft mechanics have been retained. Tidewater feels that multicraft supervision has increased work effectiveness about 3-5% by improving coordination, while craft supervision has retained workmanship at a high level.

But whether multiskilled maintenance is adopted right down the line, only part way, or not at all, it is getting increasing consideration. And the companies that have adopted it are showing that its many problems can be solved.

EQUIPMENT

Flow-Rate Regulators: W. A. Kates Co. (Deerfield, Ill.) is now offering a new, Type F flow-rate regulator for control of a wide variety of liquids and light slurries. Regulators are available for flows from 0.02 to 550 gpm., are said to control rate to within 3% of set point despite fluctuations in line pressure.

•

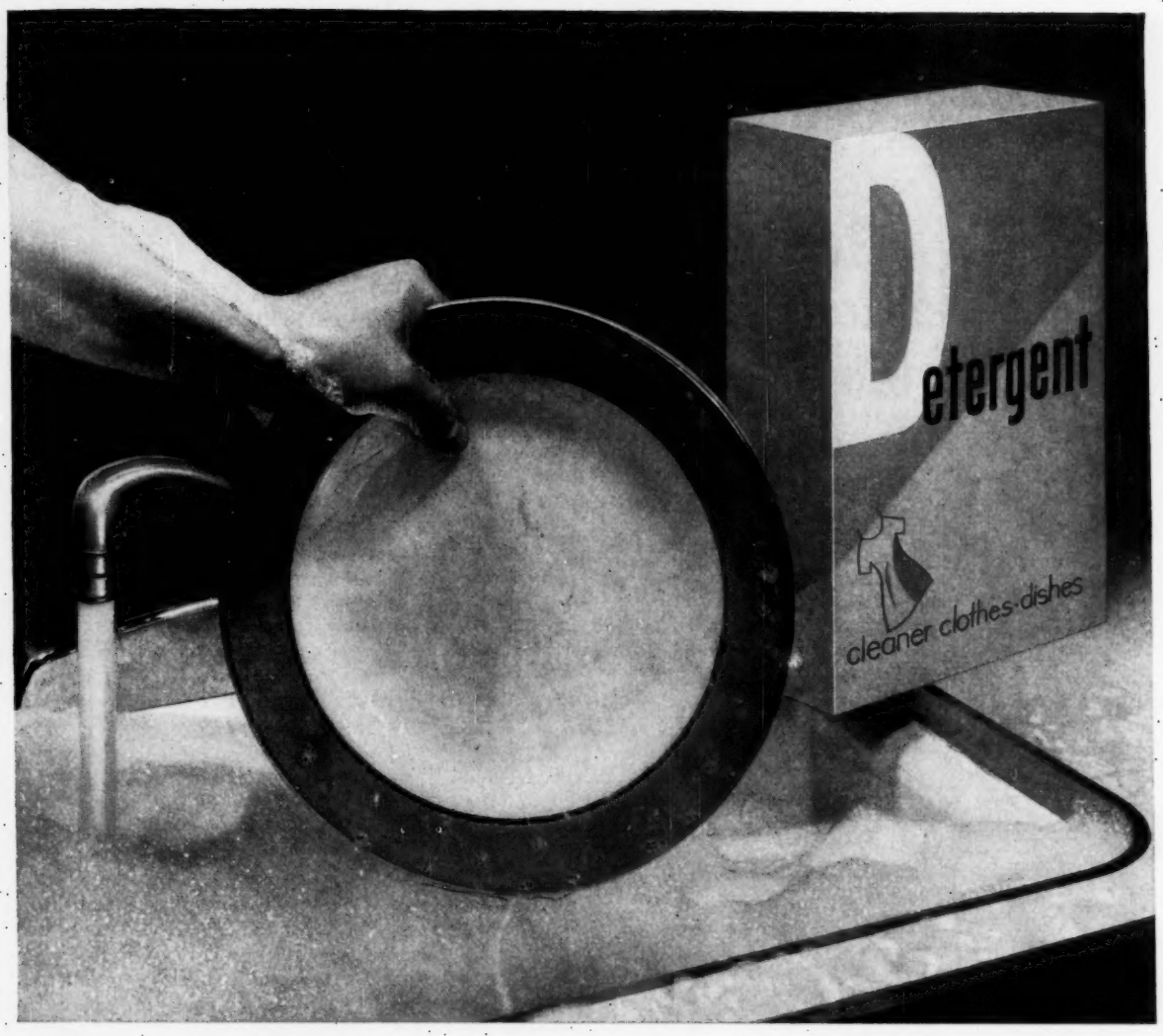
Hydrocarbon Adsorber: Selas Corp. of America's (Dresher, Pa.) Vape-Sorber unit for adsorption of hydrocarbon vapor in air and gases in ammonia and other chemical plants is now available as a standard unit. Previously offered as a custom-designed-and-built unit, the new standard models come in 14 sizes, including three for high-pressure applications.

•

Instrument Protection: Chemequip Co. (36 E. 10 St., New York 3) is out with a new device to protect instruments from line surges and pulsations. Called Flow Check Snubber, the device is claimed to withstand pressure differentials up to 30,000 psi., is applicable to instruments actuated by Bourdon tubes or diaphragms. Another advantage offered by the snubber is the prevention of gas or liquid leakage should the instrument system break down.

•

Disposable Clothing: Industrial clothing that can be discarded after use is now available from Textile Products (181-189 Chestnut St., P. O. Box 638, Newark 1, N.J.). Items of-



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What's more, these spray-dried phosphates give you the opportunity for greater package appeal. Their 70% greater bulk means a 20 to 30% larger detergent package for you. Yet, Shea phosphates cost no more than conventional types.

Solution is two to three times faster than for conventional types. These spray-dried granules are hollow, air-filled beads with a greater surface area. This permits them to go into solution quickly and easily—without prolonged agitation. They are virtually dust-free and will neither bridge nor cake.

Shipments are made promptly by rail or truck from Jeffersonville, Indiana, or Dallas, Texas. Write or phone for free samples and data, or call your local distributor.

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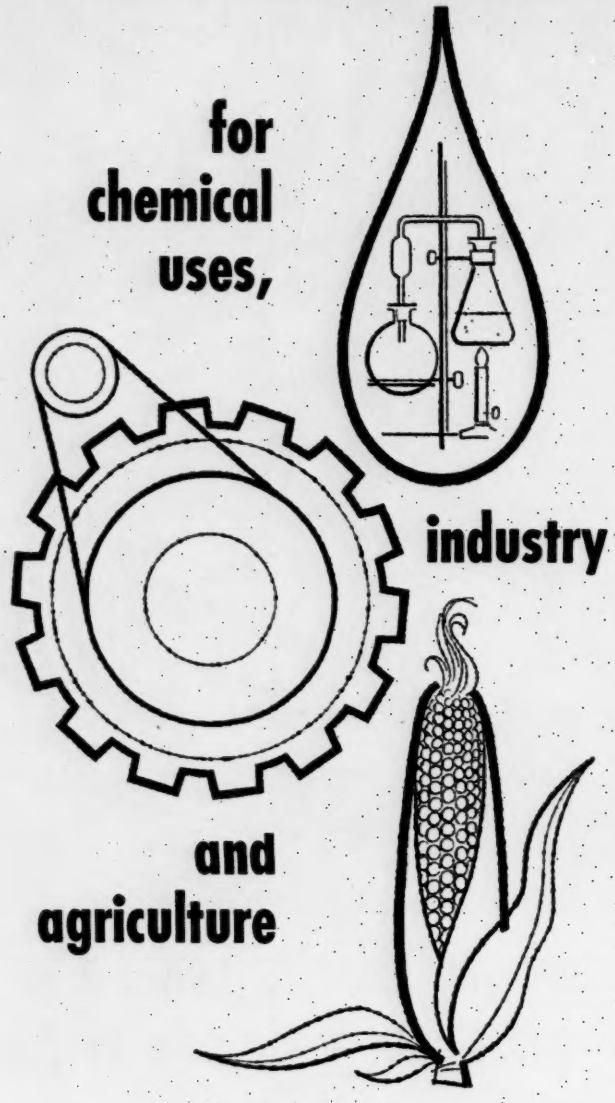

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fered include lab coats, jackets, aprons, shirts, pants. The company claims that the cost of the disposable clothing is a fraction of that of renting or laundering nondisposable garments.

•

Control Device: A new fast-acting electrical control offered by Baker Perkins Inc. (Saginaw, Mich.) is designed to stop an overloaded electrical motor during the critical peak or starting load period. Called the safe-load relay, the device can be used in conjunction with many types of motors and alarm systems.

•

Vacuum Booster Pumps: A new Series 450 Mechanical Booster Pump in standard sizes from 230 to 12,000 cfm. is now being marketed by General Vacuum Corp. (400 Border St., East Boston 28, Mass.). The company says the booster pumps provide low-maintenance operation at the high-vacuum range of 1 micron to 10 millimeters of mercury.

•

Removable Flange: Farwell Metal Fabricating (81 W. Fairfield, St. Paul 7, Minn.) has a new two-piece removable backup flange that slips over a pipe after stub ends are welded in place. Piping crews need not handle the combined weight of pipe and flanges in installing and maintaining Van Stone piping systems. The flanges, called Marzolf Laminated Flanges, are available in 2- to 30-in. tube and pipe sizes.

•

Electronic pH Meter: Hagan Chemicals & Controls, Inc. (P. O. Box 1346, Pittsburgh 30), is out with a new Hagan line-operated pH meter for continuous service in a wide range of applications. The high-sensitivity meter is said to cover a broad range of pH, is not affected by color, turbidity or chlorine in the test sample. The small, portable unit operates on a regular 100-125-v., 50-60-cycle ac. circuit.

•

Packaged Fittings: Tube Turns Division of Chemetron Corp. (Louisville) is now offering its stainless steel and nonferrous alloy fittings in individual containers made of heavy-duty paper cylinders with metal ends. The new packaging system is designed to protect the carefully machined fittings from damage in transit, and also to simplify storing and order-filling.

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What happened to the ring around

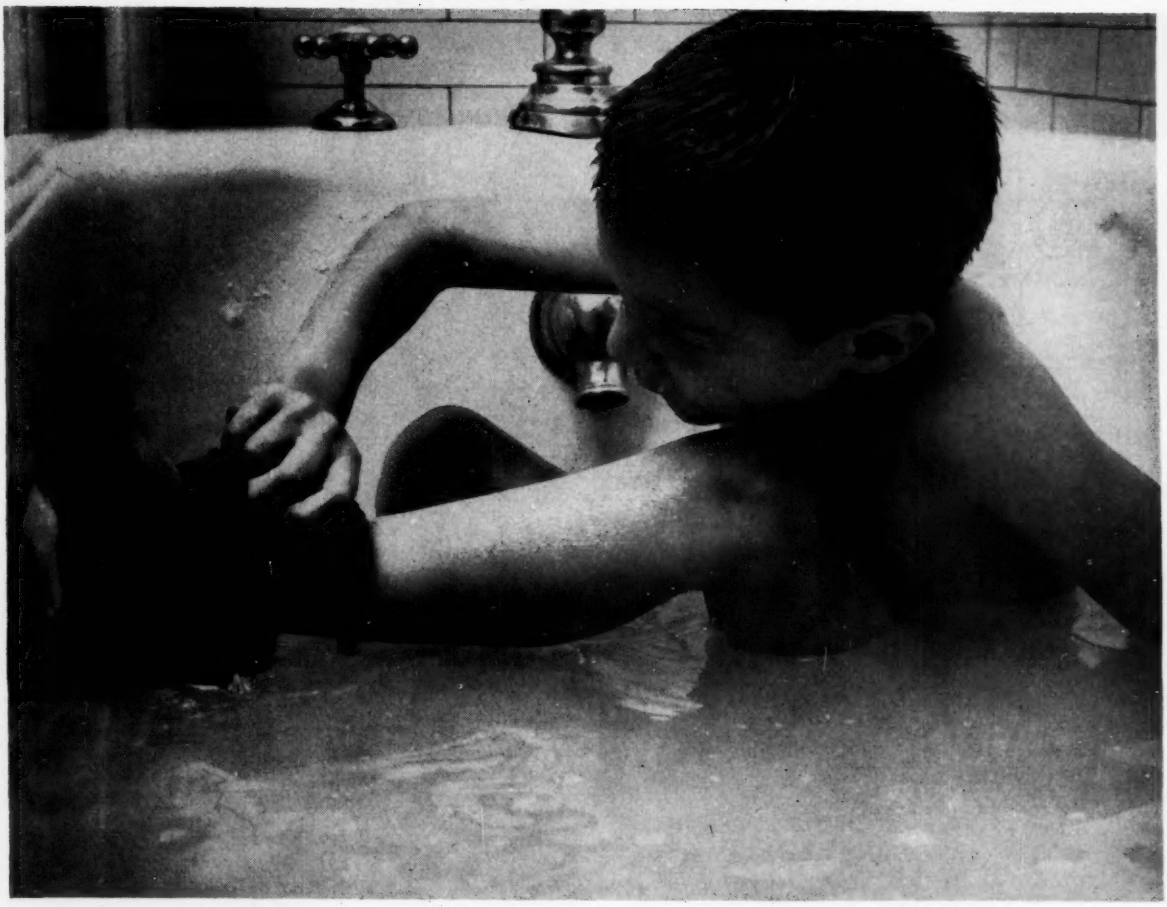
When rain falls upon the earth it seeps down through the soil and rock strata, picking up calcium, magnesium and sodium salts. It is this leaching process that makes our water "hard."

When ordinary soap is added to this salt-laden or "hard" water, calcium and magnesium combine with the soap to form insoluble compounds which are deposited as a scum or ring around the bathtub. The sodium compounds remain in solution. If the calcium and magnesium could be exchanged for sodium in these compounds there would be no ring.

There is a way, using a sulfonated synthetic resin made from coal chemicals. The resin ions are linked with sodium. When hard water is trickled through the resin, the resin trades its

USS Chemicals

Sales Offices in Pittsburgh, New York, Chicago, Salt Lake City and Fairfield, Alabama



the bathtub?

sodium ions for calcium and magnesium ions. The emergent water contains nothing but sodium compounds, which remain soluble after soap is added. There's no scum, no ring and you use a lot less soap. A fairly new development has been the addition of sequestering agents to soap. These compounds also form soluble magnesium and calcium products and eliminate scum. There are also many detergents which contain or act as sequestering agents.

Some important synthetic ion-exchange resins start with USS One-Degree Nitration-Grade Benzene. *For more information, write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.*

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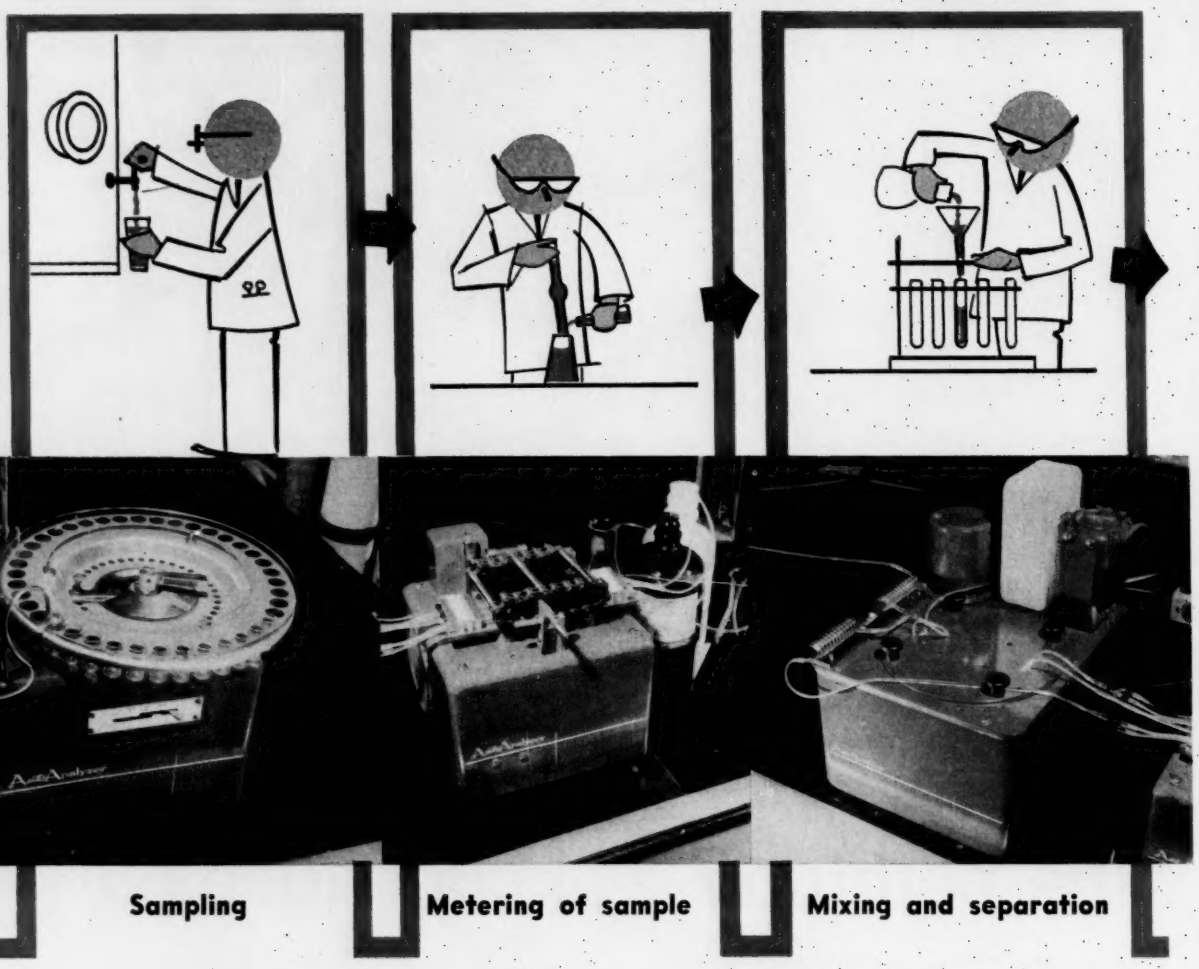


'Building Block' Analyzers Speed

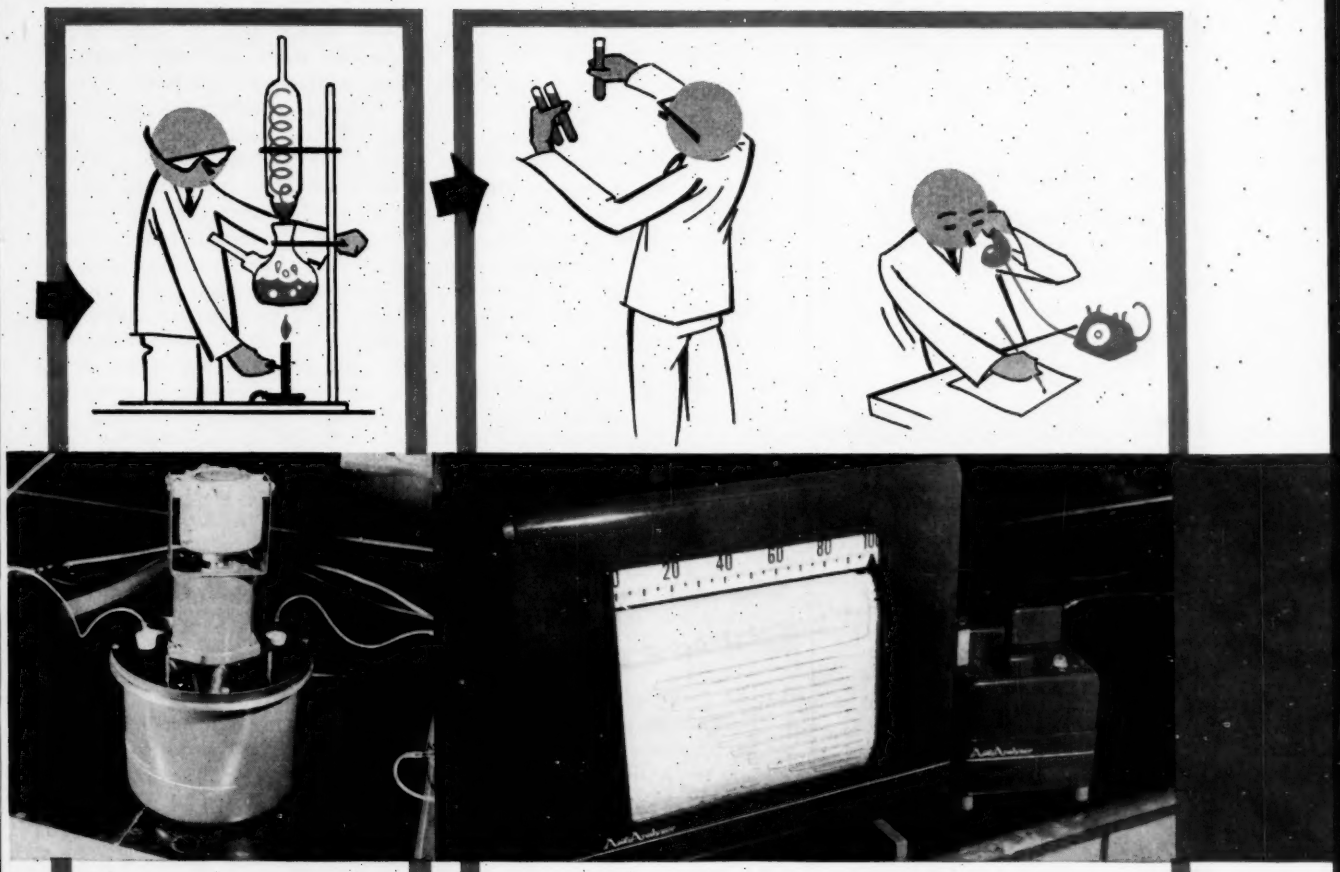
With the help of a versatile building-block instrument system — the Autoanalyzer manufactured by Technicon Instruments Corp., (Chauncey, N.Y.)—process engineers are finding new ways to speed corrective control of many chemical process operations.

Technicon has adapted its original automatic laboratory analyzer completely to the modular design, is currently readying the first rack-mounted industrial units for several in-plant process control applications.

As a class, analyzers that detect and measure primary process variables (i.e., the chemical product itself) have been riding a wave of popularity in recent years. Many process plants have switched to such techniques as infrared spectrometry, gas chromatography and nuclear magnetic resonance to replace, or at least supplement, control by measurement of secondary variables (temperature, pressure, etc.). For the most part, these direct analyzers are usable only with a narrow range of products that provide a specific type of measurable response. And quite often, the masking effect of other components in the process stream impair the accuracy and sensitivity of the required measurement of variables.

Common Denominator: In the Autoanalyzer, Technicon feels it has the answers to most of the problems that limit the range and effectiveness of other analytical instrument systems. To eliminate interference by other components, Technicon's system automatically performs the reaction or series of operations necessary to isolate the required constituent from the process stream. The selected chemical is then converted into a form that can be measured by photometric (ultraviolet or infrared), densimetric (turbidity) or colorimetric means.

The actual operations performed by the Autoanalyzer may duplicate the chemical procedure a laboratory chemist would follow, or they may go by an entirely different route. Andres Ferrari, who heads research activities at Technicon's labs, has tailored a number of analytical pro-



Reaction **Analysis, recording and feedback control**

CW PHOTOS—LIONEL CRAWFORD

Primary Chemical Process Control

cedures to the equipment, confidently predicts that "almost any chemical can be handled by this technique."

Among the principal industrial uses to date: water analysis (of feed and condensate return to boilers, cooling tower systems and of pollution-control waste systems) and fermentation process control by continuous analysis of culture-growing media. The fermentation control scheme is a good example of how cooperation between a chemical company's and an instrument manufacturer's engineers pays off in better process control.

Tightening Control: For years, says Ferrari, running a fermentation process has been almost like baking a cake. Process operators add nutrient ingredients to the culture medium according to a formula and operating conditions that experience has shown will produce a good yield. By this method, there is a good chance that the concentrations of the various nutrients will vary above or below those required for optimum yield. And since the conventional laboratory analysis took about three hours, continuous control of optimum fermentation conditions was impossible.

Ferrari worked closely with Jacques Kelly and Frank Russo-Alesi of Squibb Institute for Medical Research, came up with an Autoanalyzer procedure that cut analysis time down to 2-3 minutes. Squibb tailored the method to its own needs, now uses it to control streptomycin and penicillin processes. Charles Pfizer & Co. (Brooklyn) and Bristol Labs, Inc. (Syracuse, N.Y.), are also using the procedure, with some slight modifications of their own, for Terramycin and tetracycline fermentation processes.

Typical of the water-analysis applications of the Autoanalyzer is the control system currently under evaluation at Flo-Sweet Products Corp. (Yonkers, N.Y.). Condensate from sugar evaporators occasionally becomes contaminated with traces of sugar that could upset the balance of chemicals used for boiler water treatment, and eventually lead to damage

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INDUSTRIAL CHEMICALS BALTIMORE 3, MD.

of Flo-Sweet's steam turbines. To spot potentially dangerous sugar buildup, the company continuously monitors the condensate return. It plans to add an automatic valving arrangement that will divert highly contaminated water to the sewer. Flo-Sweet also plans to use other Autoanalyzers for control of liquid-sugar production processes.

Building Blocks: The basic units of the Autoanalyzer perform a number of specific operations that can be flexibly interconnected to provide any analytical sequence required. Here's how they work:

First building block in the system is the sampling unit. For repetitive analyses of a single chemical (such as a lab might run for control of multiple-batch processes), Technicon provides a unit that draws solution from consecutive samples (*see picture, p. 66*). This unit isn't required for continuous sampling of a single-process stream that can be sampled directly through permanently connected tubing. If the same component is to be controlled in several streams, an automatic programer is used to switch the input from various sample tubes to the analyzer.

The second component of the system is a patented peristaltic pump that meters sample and reagents and drives them through flexible tubing to the other units. The pump handles up to eight tubes; tubing diameter determines the volume pumped. Open-end tubes are also used to draw in "slugs" of air that separate slugs of liquid to prevent back-mixing of the samples. The air slugs also provide sufficient wiping action to keep the inner surface of the tubing scrubbed clean.

Mixing of samples and reagents at any point where two streams join is done by passing them through a horizontal helical glass tube. The desired component is separated by passing the sample stream through a dialyzer, which has a "receiving stream" on the other side of a semi-permeable membrane. For reactions that require elevated temperatures (either before or after dialysis), the stream is passed through a coil immersed in a constant-temperature-controlled bath. Length of the coil and sample flow rate determine the duration of the reaction.

Last Step: Final building block in the Autoanalyzer system is the detecting and recording unit. The measuring device (e.g., a colorimeter) compares the sample with a control standard, feeds a signal to the recorder. Where automatic feedback-control of the process is required, this signal can also be fed to a servo mechanism or other regulating unit.

A major advantage of the detecting system, says Ferrari, is its freedom from drift error. Since the system continuously monitors the carrier stream — even when no sample is present — it automatically compensates for changes in the carrier. And in those systems where sampling is continuous, rather than intermittent, the Autoanalyzer can be set to periodically check and adjust itself for drift variations.

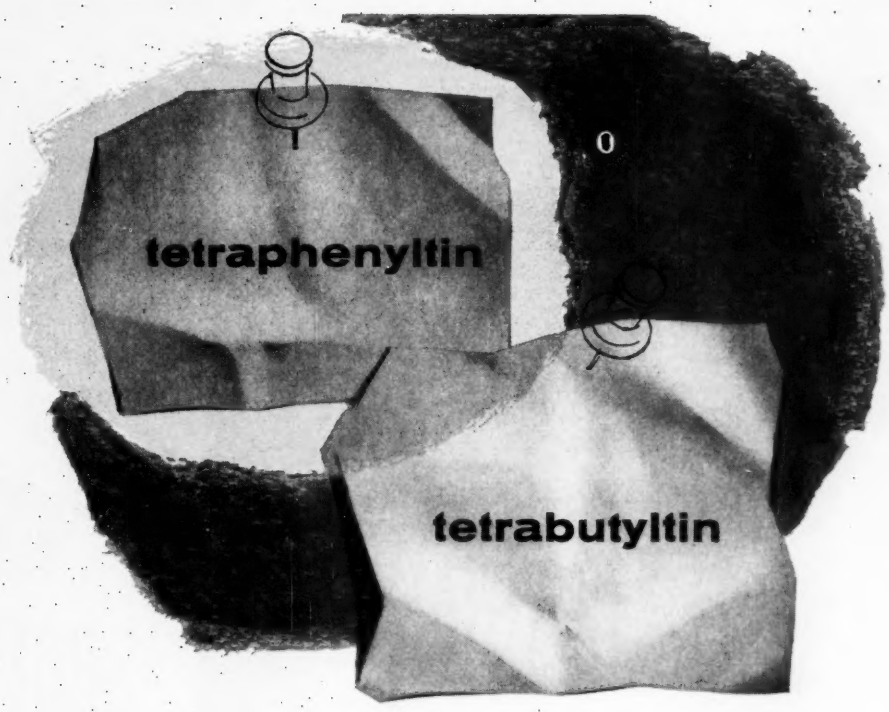
To increase the flexibility of the Autoanalyzer, Technicon is designing some new components. One is a new electrodialysis cell with greatly increased sensitivity to extremely low concentrations of chemicals.

Another innovation approaching the production stage is a special pumping arrangement for hydrocarbons and concentrated acids that can't be handled with pumps now used.

Control Costs: Initial cost of an Autoanalyzer system ranges from about $3,200 for the simplest (e.g., water analysis) to about $7,200 for one of the industrial units with built-in extras (such as automatic programing). A more complicated unit, capable of simultaneously recording four components on a single recorder, costs about $12,000.

In addition to the equipment, the initial cost covers a one-week training course for the customer's instrument technicians (one trainee per machine) at Technicon's plant. This course covers general theory of automatic analysis, as well as a thorough familiarization with the operation and maintenance of the customer's unit.

To back up the customer's routine maintenance program, Technicon has set up a staff of trained technical-service representatives in several major cities here and in Europe, keeps units packaged for 24-hour delivery by air freight. But the systems now in use have presented no unusual maintenance problems, says Technicon, and have a good record of reliable automatic operation.



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Technical data sheets and samples available on request.

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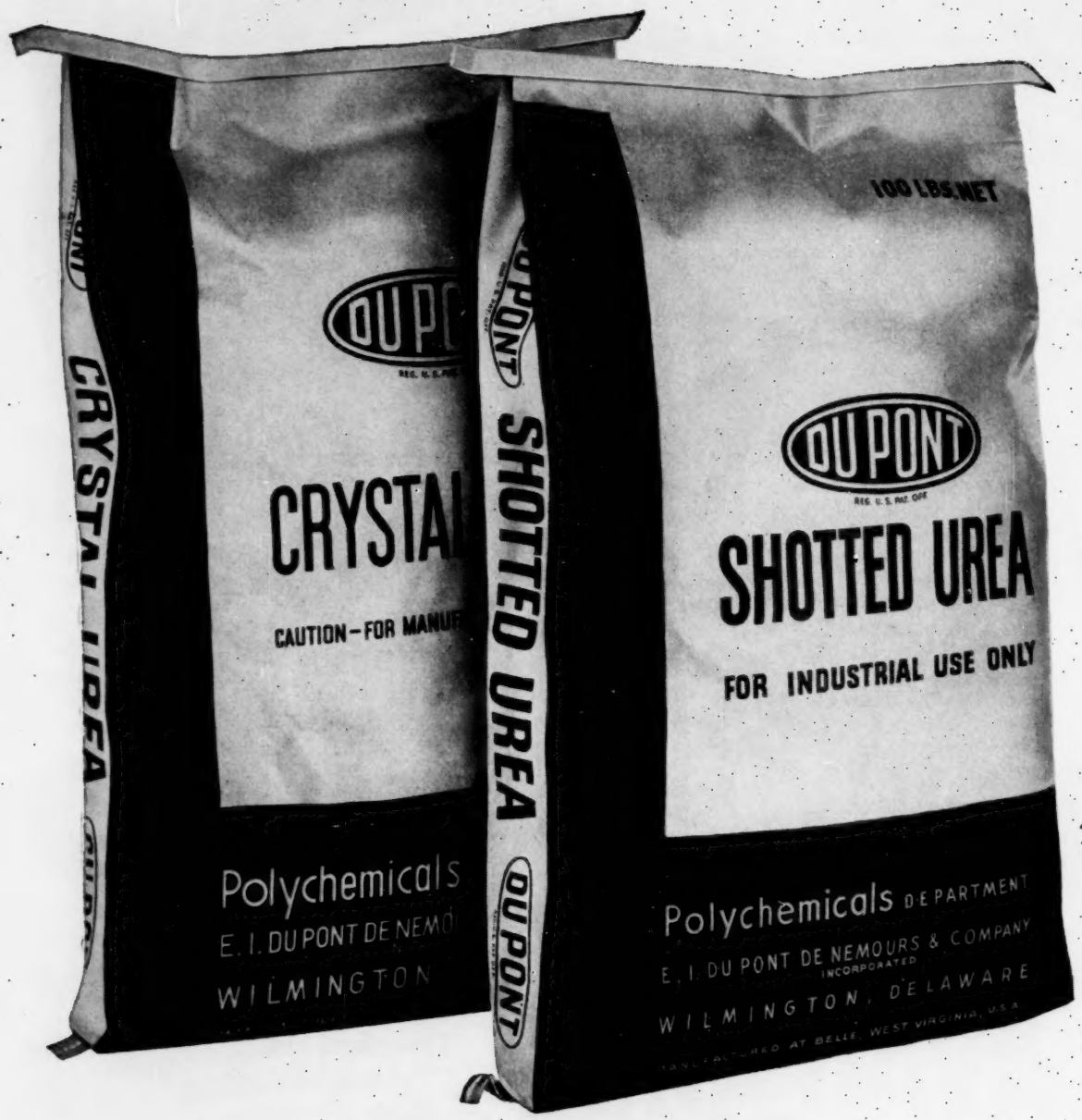

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FORMULA: $CO(NH_2)_2$

Typical Analysis for Crystal Urea:

pH (10% solution at 20° C.)	8.3
Moisture	0.25%
Ash	11 ppm
Free Ammonia	4 ppm
Iron	0.4 ppm
Color, APHA (10 gm. in 100 ml. methanol)	2
Turbidity, APHA (50 gm. in 100 ml. water at 25° C.)	5 ppm

Typical Analysis for "Shotted" Urea:

pH (10% solution at 20° C.)	9.4
Moisture	0.17%
Ash	35 ppm
Free Ammonia	150 ppm
Iron	0.9 ppm
Color, APHA (10 gm. in 100 ml. methanol)	2
Turbidity, APHA (50 gm. in 100 ml. water at 40° C.)	7 ppm

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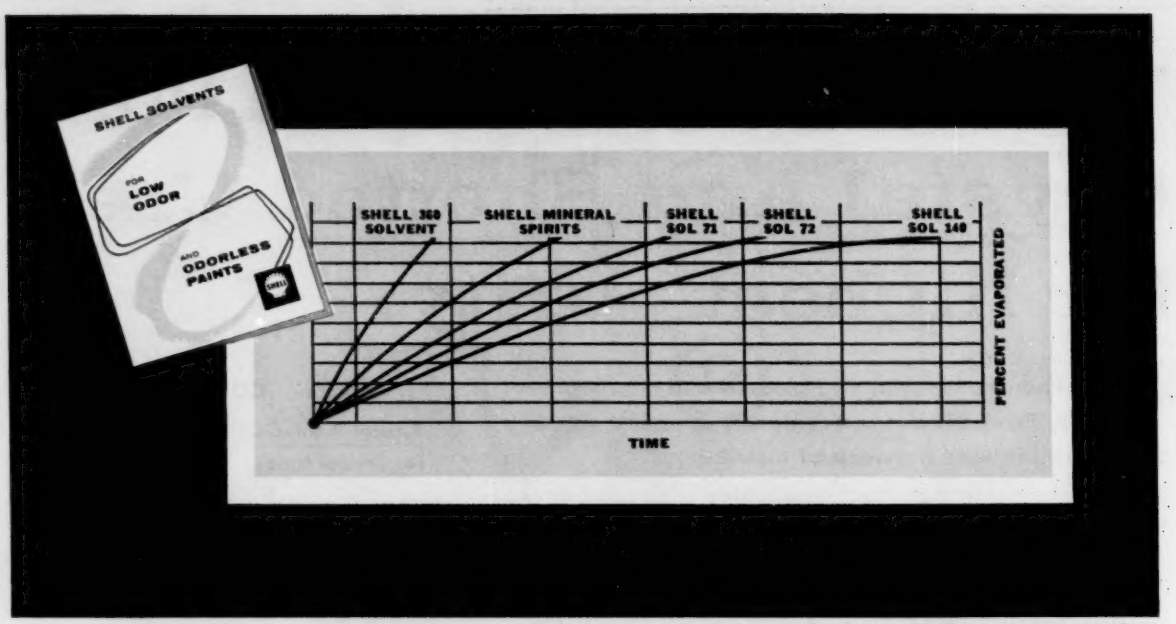

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Technology
Newsletter

CHEMICAL WEEK
August 9, 1958

Process equipment may soon cost more. This seems certain, now that the nation's largest steel producers—U.S. Steel and Bethlehem Steel—have announced selective price increases of $4.25-4.50/ton (about 3%) for sheet and strip, and Alcoa restored 0.7¢ of an earlier 2¢ price reduction on primary aluminum pig. Early last month, equipment makers told *CW* that they, like steelmakers, wanted to hold the price line in spite of steel industry wage hikes (*CW, July 5, p. 52*). The fact that "Big Steel" was able to hold out only one month before selective price increases, and Alcoa made its announcement practically simultaneously with aluminum industry wage hikes, cuts equipment makers' chances of holding the line for long. Yet, the smallness of both steel and aluminum price hikes and the fact that the steel increase was selective rather than across-the-board may help them keep rises to a minimum.

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Eastman's acetylene-ethylene process is up for licensing. The firm has agreed to have Stone & Webster Engineering Corp. (Boston) design and construct commercial plants. The method, called the Eastman flame cracking process, uses light hydrocarbon feed stocks such as liquefied petroleum gases and natural gasoline. It employs a special cracking furnace, produces by-product gases (nitrogen, hydrogen and carbon monoxide), potentially useful starting materials for ammonia, urea, methanol.

Eastman has been working in this field for several years, has operated furnaces of the type employed in operations having annual capacities of 1 million lbs. In Germany, Chemische Werke Huels has operated a commercial unit "of Eastman design."

•

Syntex S. A. got one cancer research contract and E. R. Squibb & Co. got two of the eight contracts totaling $859,442 issued last week by the government's Cancer Chemotherapy Research Center—part of National Cancer Institute. Five other contracts went to nonindustrial researchers. Total since the program was launched a year ago: 95 contracts worth $9,750,000. Industrial labs got 20 of the contracts (valued at $4,360,000)—Squibb leads with three.

•

Chemistry of Du Pont's new light-fast red pigments (*CW, May 31, p. 42*) is revealed in a trio of new patents (U.S. 2,844,484, -485, -581) assigned to the company. Claims cover linear quinacridone in alpha, beta and gamma crystal phases.

•

Add Hinconstarch, a polymer of isoniazid and *p*-aminobenzalthiosemicarbazone and oxidized potato starch, to the roster of hopeful tuberculosis drugs (*CW, Feb. 22, p. 61*). A group of Dublin clinicians report results that compare favorably with isoniazid, streptomycin and *p*-aminosalicylic acid.

Thiodan, a new insecticide, may give strawberry growers a better defense against the destructive cyclamen mites (which cost California strawberry growers an estimated $2 million/year). Not yet available for commercial application, the new miticide has shown promise in a three-year test program at University of California. Indications are that it is comparable to Shell's Endrin in its mite-killing action, but less toxic. Also, its residues dissipate more rapidly.

In recent years, methyl bromide has been used to combat the cyclamen mites. It has been effective but an expensive and somewhat difficult method. Spray treatments with Kelthane have given some control and have side-stepped the residue problem. Many applications, however, are necessary.

Thiodan is a chlorinated hydrocarbon containing a sulfite group in one of the two benzene rings. It is made by Niagara Chemical (division of Food Machinery and Chemical Corp.), will not be available before next spring at earliest.

•

An antibiotic has scored well against plant-attacking fungi in recent laboratory and greenhouse tests at the University of California (Berkeley). It's an experimental product, called GSI, of Chas. Pfizer. In the greenhouse, GSI gave good control of cucumber scab, brown rot of apricots, and cucumber downy mildew—the latter is a fungus disease of many cultivated plants.

GSI reportedly has no harmful effect on seed germination or plant growth. But it must undergo extensive field testing before it can be recommended for commercial crop application.

•

The Western Hemisphere's first geo-thermic plant is new competitor in the race for cheaper power. The unit will be generating 3,500 kw. by the end of the year at Pathe, Hidalgo State, Mexico. Source of power: volcanic steam. Technical aid in setting up the plant comes from Italy, where volcanic power has been produced for 30 years, now accounts for roughly 25% of total power. Mexican authorities expect to be able to produce 200,000 to 300,000 kw. from proved natural steam areas. Cost is expected to be considerably lower than that of hydro- or thermoelectric power. Added bonus: the new plant will yield chemical by-products, including borax, boric acid, sulfates, carbonates, ammonia.

•

Development of a hydrofluoric-acid-resistant glass is reported by American Optical Co. (Southbridge, Mass.). Described as a non-silica glass, the new product is intended for processes in which hydrofluoric acid is present in moderate quantities as a by-product or catalyst. Now available are small amounts of plate; the company is working on a frit for equipment lining. Because of the glass's tendency to crystallize, forming is a problem.

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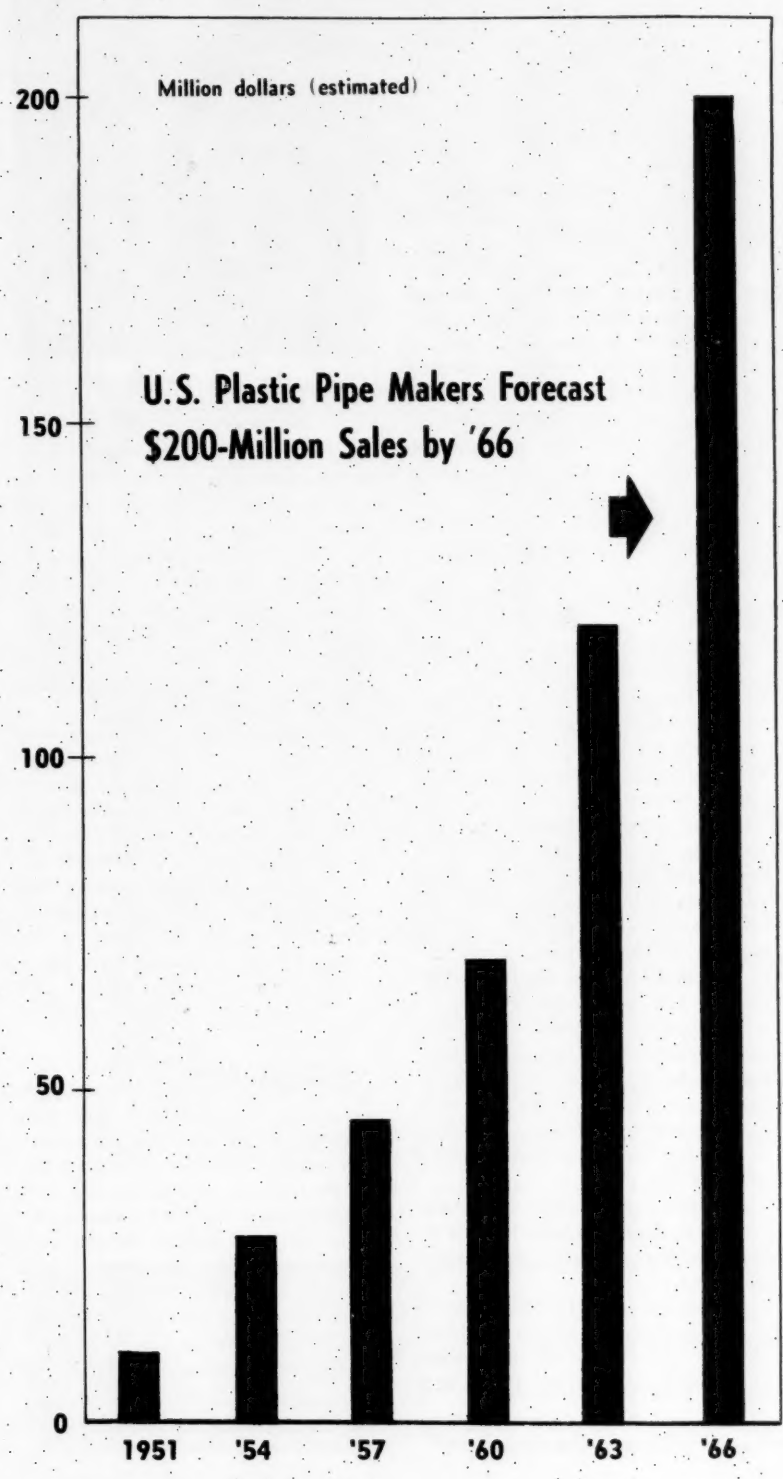
Blockson Phosphates

For Plastic Pipe: Progress with Problems



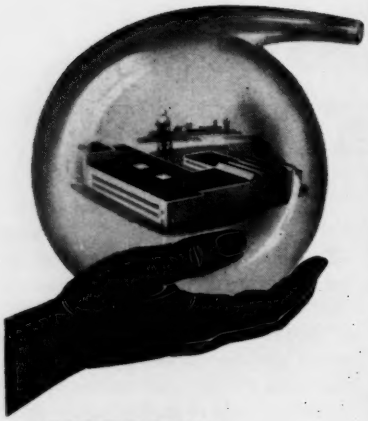
U.S. plastic pipe makers now predict that sales of their products will climb to $70 million/year by '60 (manufacturers-distributors level). That's 55% higher than the $45-million sales in '57. They're expected to hit at least $200 million by '66. But there will be problems in attaining this growth, as leading pipe makers pointed out to CW this week.

William Abramowitz, president of Carlon Products (Cleveland), spelled out the plastic pipe industry's major problems in detail. "Sales are growing," he said, "but, at the same time, profits are falling. Only the larger companies are making anything approaching normal profits."

"The biggest problem of all," he emphasized, "is created by obsolete, restrictive codes that were made long before plastic pipe had been developed. Changing the codes is difficult, largely because of powerful lobbying by makers of metal pipe, to some extent by objections of unions, but mainly because of apathy of officials who administer the codes."

Codes Slow to Crack: So far, biggest gains in the fight against antiquated codes have been scored in use of plastic sewer conduits; getting approval to use plastic pipe in water lines is far more difficult, but limited victories have recently been won. One example: the city of Cleveland recently amended its codes to permit use of certain types of plastic pipe in street-to-house water lines. The move provides a long-sought precedent that could make achievement of code revisions easier in other communities throughout the nation.

The trend toward code revisions —slow as it is—is obviously a source of concern to many makers of metal pipe. Manufacturers that make both metal and plastic pipe can afford to be more philosophic about the competitive picture. Republic Steel's J. W. Owings, for example, puts it this way: "The position of a large producer of steel pipe that also produces plastic pipe would seem to be one of objectivity; we are as interested as ever in selling steel pipe. But the particular application in this case [street-to-



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house water piping], in our opinion, gives plastic pipe the edge by a wide margin."

In any case, says Carlon's Abramowitz, the plastic pipe industry isn't exactly rocking the metal pipe business. "Out of a $2-billion pipe business," he notes, "the $40 million worth of plastic pipe sold isn't much; and although plastic pipe will grow into a $200-million business by '66,* metal pipe sales should be increasing at the same time."

Scrap Trouble: More than 50% of the polyethylene pipe made today reportedly contains scrap plastic. Major pipe producers deplore this manufacturing practice, although many often follow it themselves. Not all scrap, it's emphasized, is inferior; some types, such as that recovered from film making, can be as good as or better than virgin material. Biggest complaints within the industry are focused on those companies that resort to inclusion of inferior scrap to cut manufacturing costs; the resulting inferior pipe hurts the industry as a whole.

It's the high price of virgin material that forces many producers to use inferior materials; fabricators say price tags on virgin resins must come down. They're encouraged that polyvinyl chloride prices have dropped from 38¢/lb. to 25¢/lb. in the last two years and that foreign material is coming into the country at 21¢/lb. Prices of other plastics are expected to drop, as new competing resins appear on the market. Producers of resins do not, of course, share the enthusiasm of pipe fabricators for this solution of the scrap-resin problem.

Polyethylene Pre-eminent: Polyethylene has continued to be the most-used material for plastic pipe. But gains by other plastics in recent years have reduced its percent share of the market. According to trade estimates, polyethylene had an 84% share in '54, 68% in '56 and an expected 67% in '58.

Expanding plastic pipe sales, however, have actually resulted in an increase of the volume of polyethylene consumed.

Meanwhile, ABS (acrylonitrile-butadiene-styrene) materials will likely increase their share of the market from about 6% in '54 to at least

* These are values at the maker-distributor level; prices at customer level are 30-40% more —the '66 sales could be $250 million.

Carlon's Abramowitz: 'Obsolete building codes create biggest problem.'

16%—perhaps as much as 20%—in '58. Cellulose acetate butyrate, also estimated at 6% of the market in '54, represents less than 2% now.

Polyvinyl chloride's share is now approximately 10%, and it may improve somewhat. Miscellaneous plastics† together accounted for an estimated 3% in '54, still represent only 4-6% of the total.

Demand Debatable: The amount of polyethylene and other plastics that go into manufacture of plastic pipe is hard to pin down. But a market study by James Sayre, of Allied Chemical Corp., indicates that the current demand for polyethylene (including both virgin and scrap material) for pipe is about 50 million lbs./year; a 75-million-lbs./year market by '60 is forecast. This compares with 3 million lbs. used in '51, 22 million in '54, 33 million in '56.

Estimates by leading plastic pipe fabricators are not quite so optimistic. They say that total U.S. pipe production in '58—all types included—will require less than 60 million lbs. of plastic materials. Compared with expectations of the resin makers, estimates by pipe makers indicate that these amounts of various types of pipe will be turned out in '58: polyethylene, about 40 million lbs.; polyvinyl chloride, 4.5 million lbs.; ABS pipes, 7 million lbs.; butyrate, about 600,000

† Includes vinylidene chloride, polyester (glass reinforced), phenolic asbestos, epoxy (glass reinforced), tetrafluorethylene, methyl methacrylate, and phenolic pipe.

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lbs.; other plastics, some 4 million lbs.

Competition from Newer Resins: Medium-density polyethylenes, say fabricators, yield good-quality pipe, and their use is growing steadily. Pipes made from high-molecular-weight polyethylenes are coming into the picture, but it's too early to predict how much of the pipe market they will capture in the next few years. They probably represent less than 5% of the current market.

High-molecular-weight polyethylenes will probably be used mainly to make thin-wall pipe. But many fabricators fear they may be forced to make thin-wall pipe from these resins prematurely—before the products are adequately tested and before the industry has time to agree on specifications. High-density products are reportedly susceptible to stress-cracking—a difficulty not encountered with pipe made of ultrahigh-molecular-weight polyethylenes. (Stress-crack-resistance is tied closely to molecular weight; pipe made of polymers with weights above 500,000 meets extremely severe flexing and stress-cracking tests.)

Polypropylene pipe reportedly has advantages over pipe made from ordinary polyethylene but is considered inferior in some respects to pipe made from ultrahigh-molecular-weight polyethylene. Many problems—e.g., high prices, sensitivity to cold—must be solved before polypropylene can become an important contender in the plastic pipe field. Consensus is that polypropylene will find an important place; but some fabricators now decry pushing polypropylene onto the scene before enough is known about it.

Foreign competition, particularly from the Japanese, is expected by some to give U.S. plastic pipe producers a rough time. This is another reason, say fabricators, why production costs and raw-material costs of domestic pipe must be reduced—but not by use of low-grade raw materials.

Some resin producers, however, say that pipe would be too expensive to ship from Japan, is no real threat to fabricators. But resin from which pipe is made will be shipped, they say; and resin producers—not fabricators—in this country will bear the brunt of the competition.

Farm and Home Uses Lead: Complete end-use breakdowns for all types of plastic pipes are not available, but uses of polyethylene pipe are fairly well defined. Household piping and farm lines are now tops in this market; each use takes roughly 13-16% of the total market. Farm uses probably lead now, partly because of the slowdown of house building.

Lawn watering systems account for perhaps 8-10% of the total market. The market for polyethylene pipes in "jet" well lines is about the same as for lawn watering systems, will probably grow apace.

Irrigation and subirrigation uses account for 5-6% of total polyethylene pipe used, will increase at a moderate rate. Incidentally, growth of plastic pipe use in this application will now be aided by availability of plastic pipes in diameters up to 14 in. (Plastic pipes up to 24-in. diameter are made for specialty purposes.)

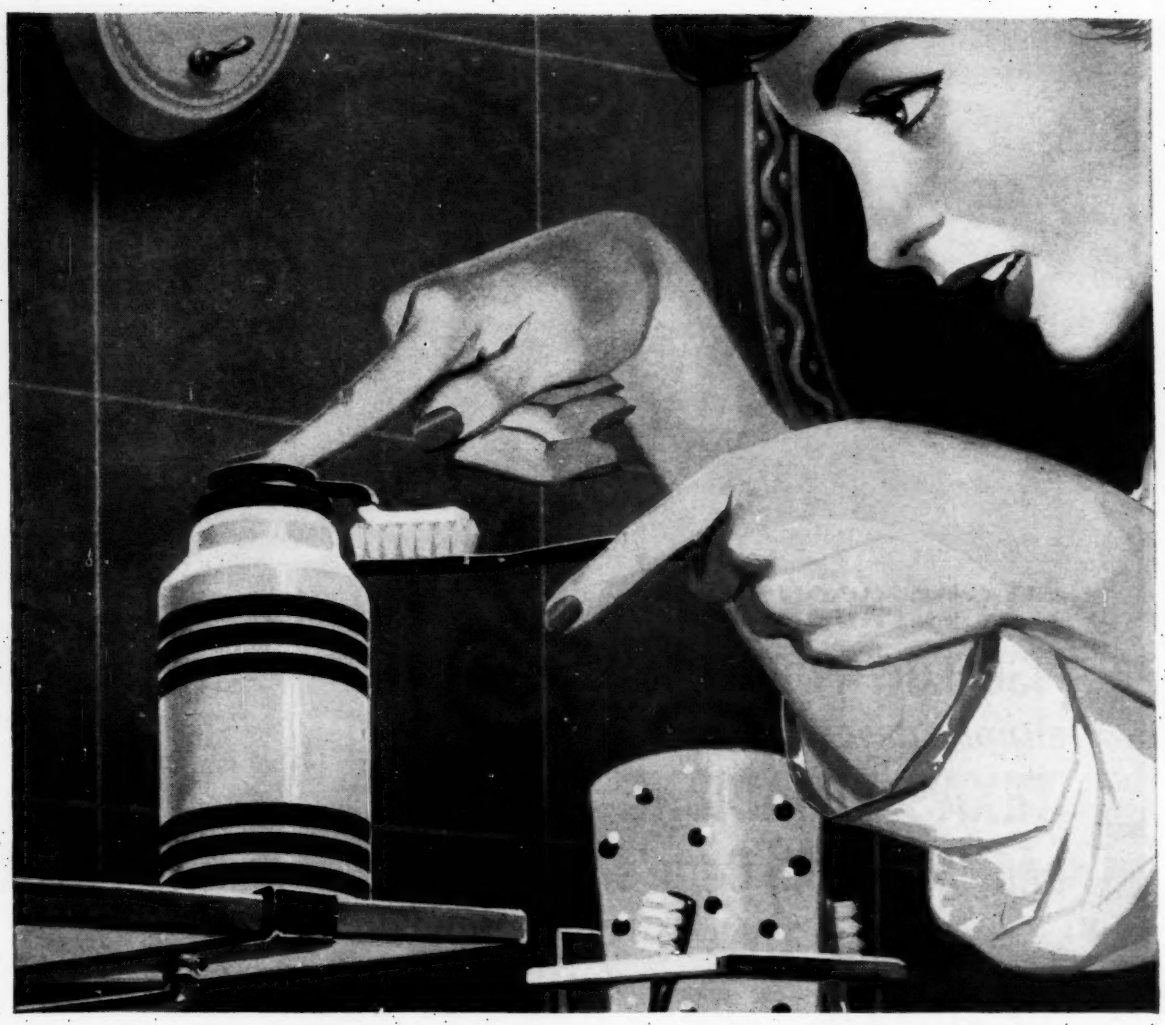
Availability of pipe in larger sizes is a big factor in broadening plastic pipe uses at the expense of competing products. For example, cement asbestos pipe—use of which in water transmission is still growing fast—is facing heavy competition from ABS polymer pipes, which are now made in larger sizes. In sizes above 6-in. diameter, however, cement asbestos still has a price advantage.

Engineers who design chemical plants are reportedly paying more attention to plastic pipe, particularly that made of polyvinyl chloride, Kralastic** and ultrahigh-molecular-weight polyethylene.

Clearly, potential markets for plastic pipes are diverse and big; and industry efforts to promote quality standards for their products will do much to open those markets. (National Science Foundation, for example, has instituted a labeling program that permits the use of the NSF seal of approval on pipe that passes the foundation's tests.) But it's equally certain that resin producers and fabricators alike have many problems to overcome if these potentials are to be realized.

Competition within the plastic pipe industry, from producers of nonplastic pipes and from foreign pipe makers will be rough. And it's generally conceded that there will be no easy way to quick profits, which will, instead, be earned through continuing product improvement and a striving for lower prices.

** U.S. Rubber's tradename for a styrene-acrylonitrile copolymer pipe.



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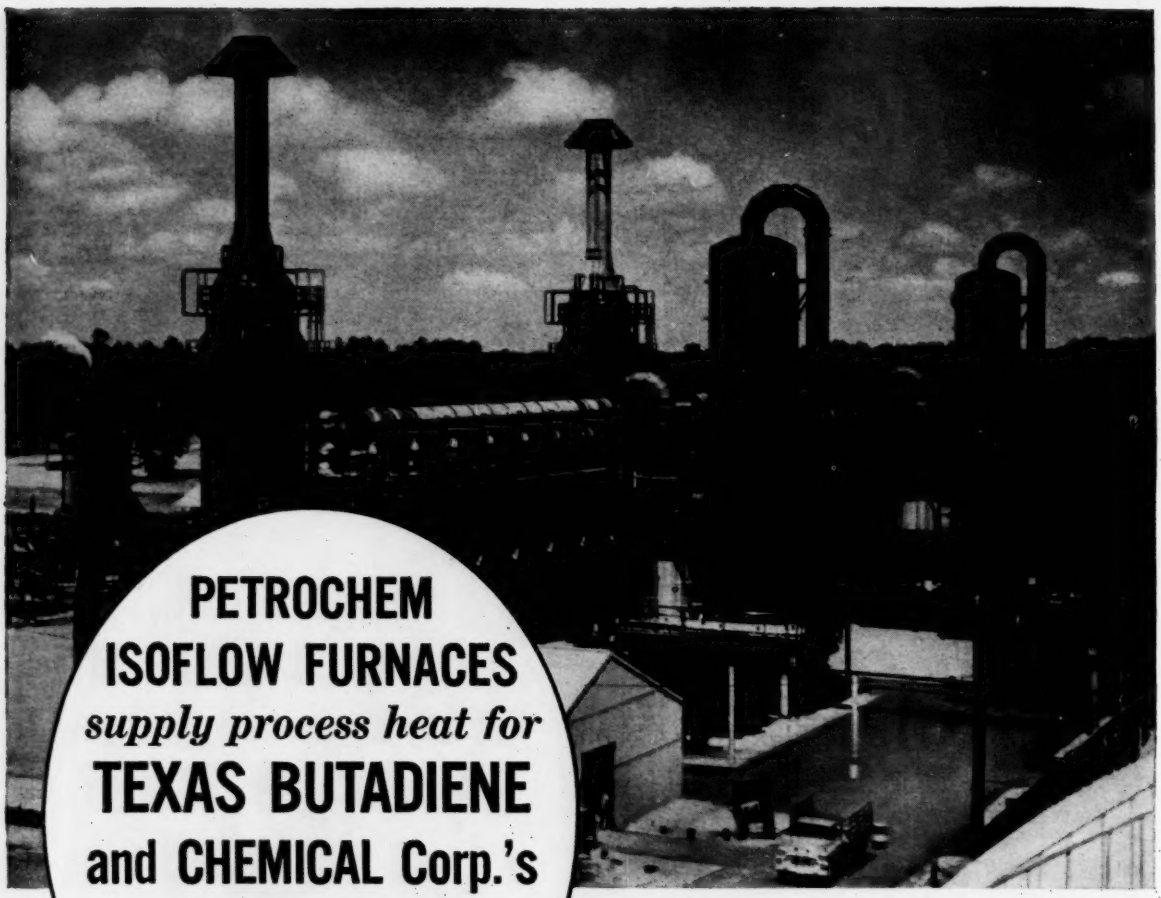

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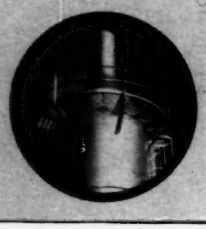


Market Newsletter

August 9, 1958
CHEMICAL WEEK

Last week's aluminum price advance of 0.7¢/lb.—initiated by Aluminum Co. of America—was a big surprise to the industry, according to some reports. But the probability of an impending increase in domestic prices was broadly hinted weeks ago (*CW Market Newsletter, June 14*). And other producers were out with similar hikes within hours of the Alcoa notice.

It was no secret a few months ago that U.S. makers were bitter at being "forced" to follow Canada's Aluminium, Ltd.'s cut, which dropped the basic U.S. pig price to 24¢/lb. from the previous 26¢. Most makers here were convinced that bargain-pricing the metal was not an effective way to pep up demand—especially since the industry was facing wage hikes. These boosts, effective Aug. 1, stem from the three-year labor agreements signed in '56.

But while there was little doubt that all U.S. aluminum makers would go along with an increase, the big puzzler was the course Aluminium, Ltd., would follow. This firm, whose major English markets have been inundated by cut-rate Russian metal, faced a tough problem: Should it continue to try to combat a fluid Russian price, or should it again match the higher U.S. price level? The decision came early this week: its price in the U.S. would be raised; its prices in other countries would remain as they are "for the present."

Will the new price hold for long? Probably not. Aluminum marketers are voluble in pointing out that the 0.7¢ hike is only a fraction of the earlier 2¢/lb. drop, comes nowhere near offsetting the wage increases given under the three-year contract.

But here's a certainty: the aluminum industry will step up its campaign for federal protection against lower-priced foreign imports. Even the slightly increased new domestic tags make the U.S. market more attractive to encroaching foreign producers.

•

The phthalic anhydride market has simmered down since last week's surprise announcement by Amoco Chemicals that it will start writing business at a 17¢/lb. price (*CW Market Newsletter, Aug. 2*).

Major phthalic-from-naphthalene producers have ostensibly decided to "sit tight" with their current 21¢/lb. tag, at least until it is certain that the newcomer will be delivering material at the lower price. There's an uneasiness in the trade that some marketers may, for competitive reasons, be on the verge of matching Amoco's "promise," but even that eventuality seems tenuous at this point.

•

Latest to boost prices of rayon filament textile yarns is Industrial Rayon (Cleveland). The company has decided to make its tags "com-

parable" to those recently announced by other producers (including Du Pont and American Viscose).

The increases, effective immediately: 5¢/lb. on 75- and 100-denier yarns; 3¢ on 150-denier; and 2¢/lb. on heavier deniers.

•

Custom blending of plasticizers in bulk quantities is Monsanto's latest lure for West Coast customers; newly completed facilities at its Long Beach, Calif., plant make the deal possible.

The company will make any "feasible blend" of its plasticizers if the order is in tank-wagon quantity (about 3,000 gal.). The blends will be priced at the composite bulk price of their ingredients.

•

More news from the "instant" emulsion market: Colton Chemical reports that prices on its "redispersible polyvinyl acetate in powdered form" are down 9-19½%, depending on quantity ordered. Earlier, Shawinigan Resins sliced prices by as much as 7¢/lb. (*CW, July 12, p. 53*). Behind both cuts: a desire to broaden markets for the still-developmental products.

Colton's material is labeled Vinac RP-250 Powder, and, says Bernard Krashin, president of the Air Reduction division, "the powdered form of PVAc permits use in formulations where a high percentage of water cannot be tolerated in the finished product, or in an intermediate stage of formulation or blending of dry materials."

•

U.S. custom smelters have raised copper quotes ½/lb., pushing their price to 27¢. That moves the metal closer to the 27½¢/lb. "floor" the government is expected to pay, should stockpiling resume. There has been some consumer resistance to more-expensive copper, but observers peg the current strengthening in price to a stronger tone on the London Exchange, plus some trade expectations that restrictions on buying of Western metal by the Soviet bloc may be lifted.

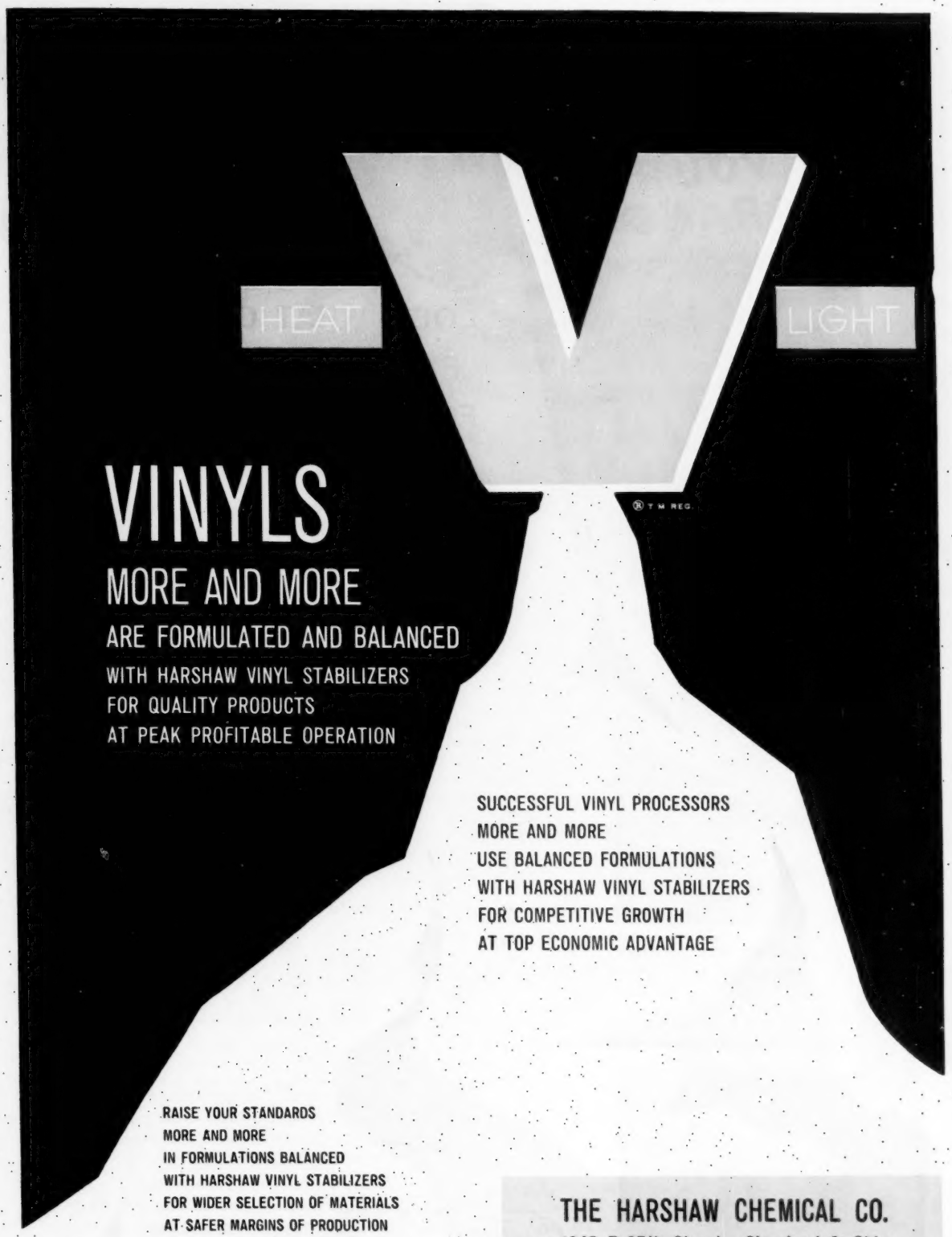
Users of 2-vinylpyridine get a price break this week. Reilly Tar & Chemical is chopping tank-truck tags to $1.25/lb. from the previous $1.31 quote. Price for quantities of 10 or more drums is reduced from $1.34 to $1.30, and the one-to-nine drum price is $1.45, 3¢ under the previous price.

The reductions, first since Oct. 57, were made possible, says Reilly, "by greater operating efficiencies."

SELECTED PRICE CHANGES—WEEK ENDING AUGUST 4, 1958

	Change	New Price
UP		
Alumina, calcined, bgs., c.l., wks.	$0.0025	$0.05
Mercury metal, 76-lb./flask, net flask	3.00	233.00
DOWN		
Ammonia, anhyd., fertilizer, tanks, wks., frt. equald., ton	$8.00	$80.00
Tin metal (Straits)	0.0075	0.9550

All prices per pound unless quantity is stated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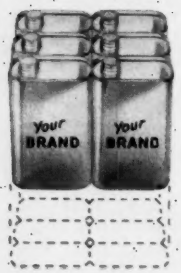

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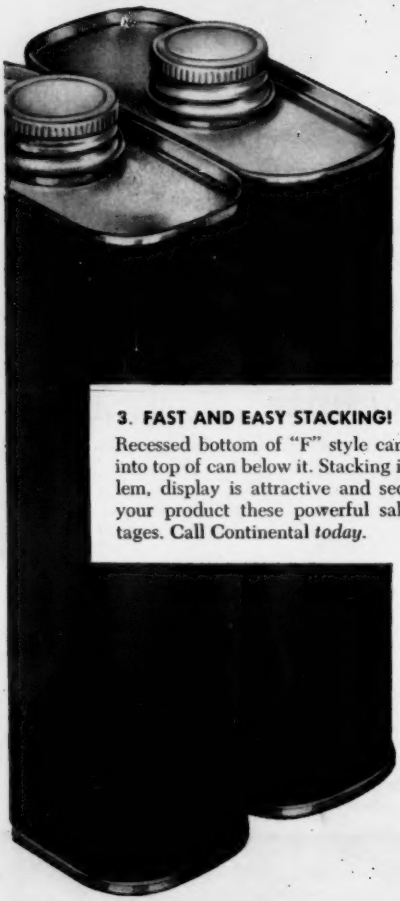
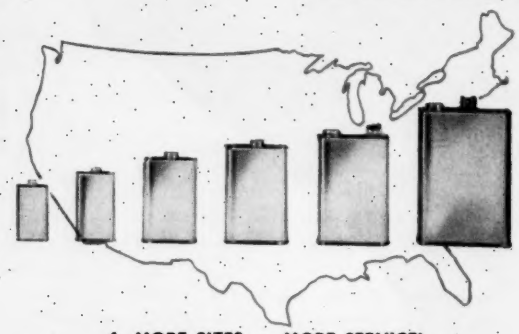


3. FAST AND EASY STACKING!
Recessed bottom of "F" style can fits right into top of can below it. Stacking is no problem, display is attractive and secure. Give your product these powerful sales advantages. Call Continental *today*.



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Air freight will soon move into jet age, offer chemical shippers new inducements to "send it by air."

Airlines' New Concept: Warehouse on Wings

The next few months will see the introduction of jet airliners on regularly scheduled flights, when Pan American puts big 600-mph. planes into transatlantic service. And not long after, the jets will make their appearance on domestic runs. Present schedules will be halved: Europe will be seven hours distant from New York; the West Coast, five. With the introduction of the jets, the airlines will intensify their pitch for more air-freight business.

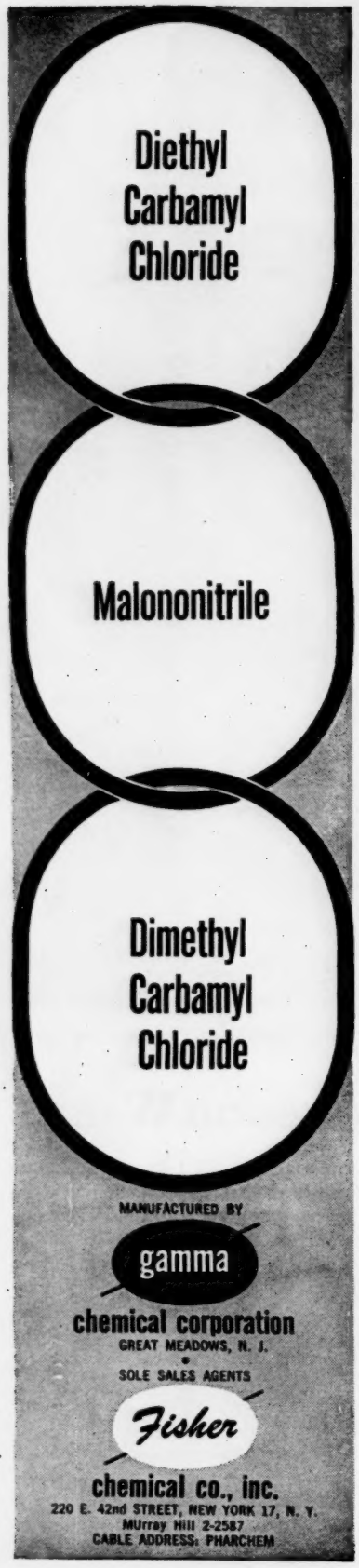
They'll soft-pedal air freight as an emergency measure or a means of backstopping "goofs" made by shipping departments. Instead, they'll plug the need for high-level management to take a searching look at their firms' over-all distribution setups—what the airlines people call "the total marketing concept."

And with the U.S. reduced to an area of less than 100-mile radius, in terms of surface transport, the chemical sales executive might well ponder such questions as: Can we now consider competing in areas in which we previously could not promise quick delivery? Could we get by with fewer warehouses? Must we maintain the same depth of inventory in warehouses?

Answers will differ from company to company. Eli Lilly, for example, which doesn't own warehouses at its various distribution points, will probably arrive at a different conclusion than, say, Abbott Laboratories, which does.

Day or Night: Crookes-Barnes Laboratories, drug house of Wayne, N.J., is using air freight to distribute its products from just two stockpiling locations — Emery Air Freight Corp. depots on the east and west coasts.

To provide immediate shipments—day or night—to any area, C-B maintains special tape-recording equipment at company headquarters. After-hours callers hear a taped message giving



the telephone numbers of executives who can arrange immediate shipment. Within minutes, a shipment can be on its way from either depot to the first available flight. C-B salesmen find the system makes a telling sales pitch.

Emery is looking for this approach to gain in popularity. Effective next month it will reduce rates on the shipment of drugs to 45 key areas of the U.S. The new rates are 20% lower than the 1948 rates.

National Drug Co. is another enterprising air-freight user. This is how Traffic Manager D. W. Spare explains the company's month-old "air drop" distribution:

Shipments bound for Dayton, Cleveland and Detroit are put into separate large containers which are taken nightly to the airport. At their respective destinations, the containers are opened and the already-addressed small packages they contain are sent (parcel post) to customers.

The system eliminates a branch distribution point at Toledo, reportedly will save almost 50% in the cost of distributing to this area. Delivery, of course, is speeded. National also uses the system to ship to Dallas and Boston and is considering other likely areas.

No One Way: These operations would not necessarily work for everyone. Each company would face different distribution problems, would have to figure different factors into the total picture. The airlines don't minimize this. Right now they're offering a service called a distribution audit, to directly inform management—not just traffic men—of the possibilities of air freight as an integral part of the distribution pattern.

The audit considers such factors as nature of the market and product, promotion problems, order-handling procedures, direct account's buying habits, etc. One such analysis is said to have shown a chemical maker how to save $2,717/month by distributing direct from plant to consumer—bypassing the warehousing operation with air freight. Cost of transportation, handling and insurance and allowances for storage obsolescence and taxes under old and new methods were compared. Most charges were less when air freight was used.

But more than costs should be considered. In chemical marketing, where there usually is little product differentiation to influence a sale, better service—and often the suggestion of better service — can mean a jump on competition.

Millions of Ton Miles: The figures on one carrier give a rough idea of how the air-freight business can grow. This year, American Airlines will handle about 90 million ton miles of air freight (not including air mail) out of a U.S. total of 500 million ton miles. When American gets full delivery of its jets, late in 1960, its freight-carrying capacity will equal the total present U.S. air-freight capacity.

It has taken almost 10 years for American to double its air-freight load. In 1950, the line carried 44 million ton miles of freight.

Overseas shipments have gone steadily up, too, with KLM, Pan American and Seabord & Western—the "Big Three" in international cargo—putting out heavy efforts to induce shippers to choose the air route. Drugs and related items currently make up almost 10% of outgoing cargoes.

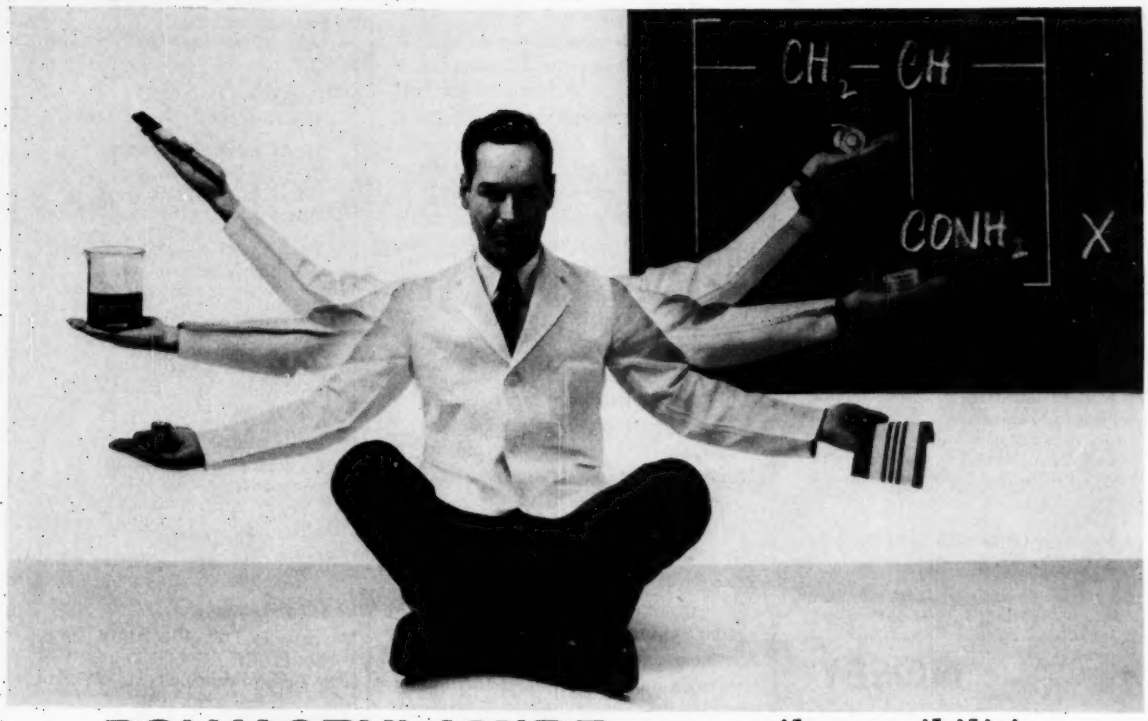
Long Look: There are numerous drawbacks to air freight. Weather may delay flights (about 5% of scheduled flights do not get off the ground), some areas are not freely accessible (North-South runs limited) and costs — no matter how much you consider "total concept"— are still high. Encouraging point: air-freight rates have gone down as loads have increased; it costs about half as much to ship a ton mile now as it did in 1945.

Also important to sales management is the greater freight capacity of the jets. A Boeing 707 can take twice the cargo load of a DC-7. One airline is talking about an all-freight jet-prop liner with an 18-ton load capacity.

This means that industrial air-cargo loads of the future will not be limited to high-cost, low-volume products. Although chlorine and sulfuric acid will never go air freight, a host of industrial chemicals and specialties may well come within the broadened economic scope of sky carriers.

One airlines official has this to say about bulk shipments, "We have already shipped in bulk—things like coal and oil during the Berlin airlift. And we often handle 12,000-lb. stuff. Yes, there will be bulk shipments. We can't say exactly when, but they'll come."

NEW PRODUCT DIRECTIONS



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No other water-soluble polymer matches the versatility in application of Polyacrylamide. Polyacrylamide exhibits excellent tolerance for salts and does not precipitate when added to solutions of sodium tetraborate, boric acid, aluminum sulfate —to name just a few. Polyacrylamide solutions show little change in viscosity through a pH range of 3-9. Solutions of Polyacrylamide can be brought to a boil or chilled to their freezing point and remain homogeneous.

As a protective colloid, Polyacrylamide widens techniques of emulsion polymerization and protects particle size and dispersion through unusually severe storage or application conditions.

In short, Polyacrylamide offers possibilities for product improvement and product development in coatings, adhesives, paints and other aqueous solutions or emulsions. Available as a free-flowing powder, Polyacrylamide is supplied in several grades. These permit considerable flexibility in obtaining a desired solids content in a formulation when control of viscosity is critical.

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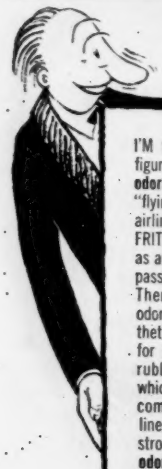

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DATA DIGEST

• **Adipic Acid:** New products manual on this acid covers the properties, reactions, current and potential uses. $1, Du Pont Polychemicals (Wilmington, Del.).

• **Epoxy Resins:** Eight-page brochure summarizes the uses of epoxy compounds in various industries such as metal-forming, plastics-forming foundry practice, building and maintenance, chemical processing, electronics and electrical manufacturing, and appliance, automotive and aircraft manufacture. It includes formulations, properties of resins, suggestions for alternative fabrications and processing methods. Marblette Corp. (Long Island City, N. Y.).

• **Polyethylene Packaging:** Just-published new booklet describes packaging opportunities created by polyethylene, and use of the plastic in coatings, films, moldings. It shows specific application where each of these forms is proving valuable. U. S. Industrial Chemicals Co. (New York).

• **Organic Chlorine Compounds:** A new 45-page booklet describes 11 organic chlorine compounds, details physical and physiological properties, provides information on use, shipping regulations, handling and storage, and specification and test methods for the compounds described. These are ethylene dichloride, Chlorasol fumigant and solvent, propylene dichloride, trichlorethane, butyl chloride, 2-ethylhexyl chloride, dichlorethyl ether, dichlorisopropyl ether, triglycol dichloride, ethylene chlorhydrin, epichlorhydrin. Union Carbide Chemicals (New York).

• **Surface-Active Agents:** New 40-page technical bulletin on adducts of nonylphenol or tridecyl alcohol with ethylene oxide is available. These surface-active agents, trademarked Surfonic, find use in the preparation of agricultural chemicals, household and industrial cleaning compounds, textile processing chemicals, concrete additives. The manual gives information on analytical procedures, physical and surface-active properties of these nonionic surface-active agents. Jefferson Chemical Co. (Houston, Tex.).

• **Cobalt:** Two new sheets on electrolytic polishing and metallographic reagents for cobalt and its alloys are available. Cobalt Information Center (Columbus).

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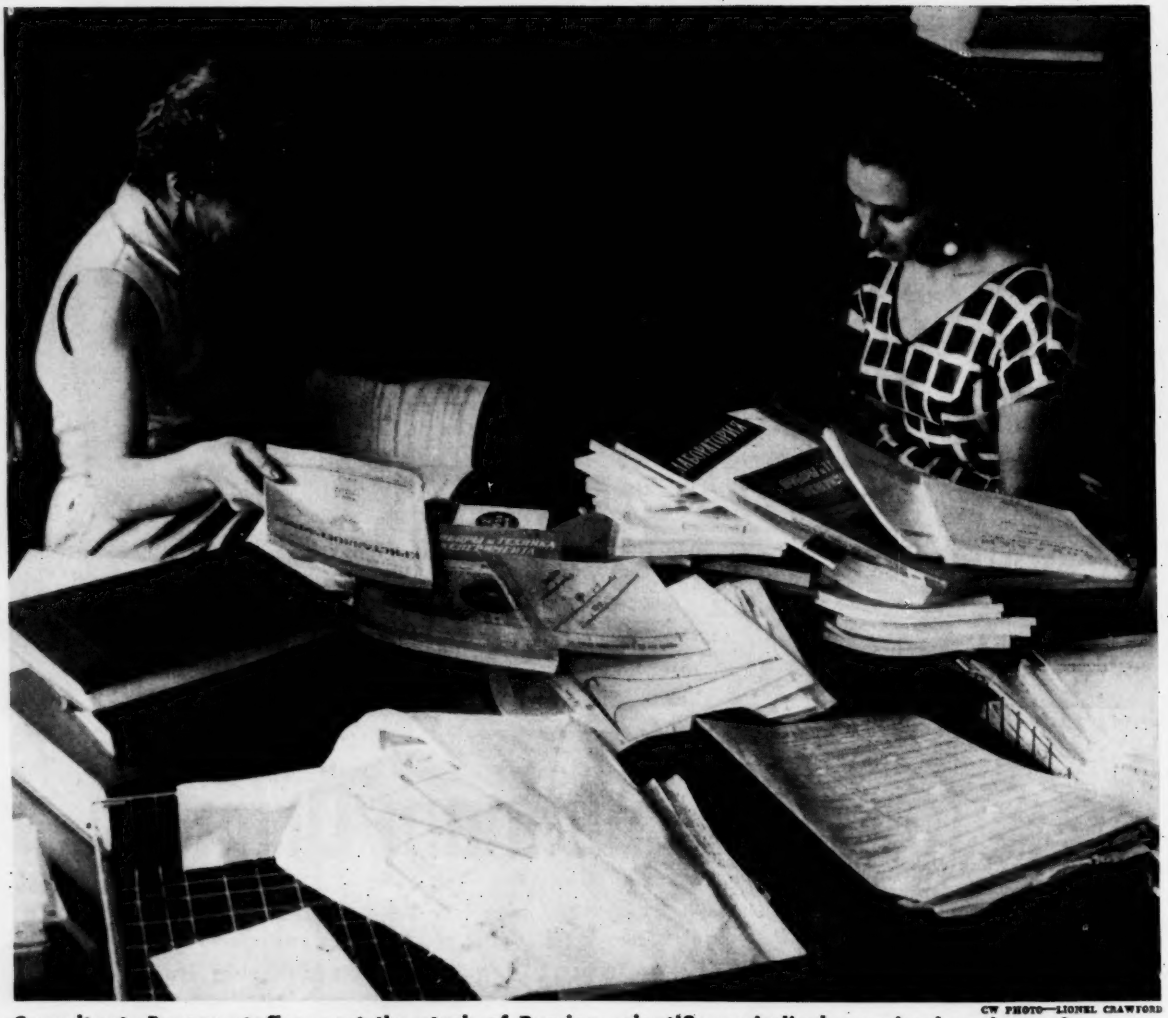

CW PHOTO—LIONEL CRAWFORD

Consultants Bureau staffers sort the stack of Russian scientific periodicals received each week.

Speeding Up the Reading of Russian

At least one commercial firm has discovered gold on the other side of the Russian-American language barrier. It is Consultants Bureau, a New York company specializing in scientific translations. CB's business (now about $750,000 gross) has doubled each year for the past three years—and this week CB President Earl Coleman is looking ahead to greater gains.

Behind Coleman's optimism is simple arithmetic and the snowballing demand for Russian scientific data. At least 200 of the 1,000 Russian journals available in the U.S. are potentially important sources of scientific material. But today, CB and nonprofit Pergamon Institute (New York) — the two organizations that do almost all nongovernment cover-to-cover translations of Russian journals — handle only about 44 Russian periodicals between them.

By comparison, the Soviets translate 1,400 of approximately 1,800 U.S. periodicals, employ 2,000 translators for the job (*CW, Oct. 27, '56, p. 140*).

Pooling the Cost: New government and industry support is behind the spurt in the translation business and is also helping to gradually reduce its cost to individual users. For example, 13 pharmaceutical companies recently worked out a cooperative plan with Consultants Bureau to publish a cover-to-cover translation of the monthly Russian journal *Pharmacology and Toxicology*. Each contributes $300, gets 5 one-year subscriptions. Coleman reports some have already saved this sum in fees previously paid for occasional translations of articles from the same publication.

Government support comes indirectly from National Science Foun-

Keeping track of journals sent to CB's 300 scientist-translators.

Translated journals are filed by category in the bureau's library.

Technical Publications

dation. NSF allots its government appropriation for translations to other societies and agencies (e.g., National Institutes of Health, Ford Foundation), which in turn decide which journals are to be translated. These organizations contract and pay for cover-to-cover translations, receive 400 subscriptions to each, which are distributed free to libraries, universities, etc. As a result of this support, the translating firm can offer subscriptions to other customers at relatively low cost.

What's in the Works: To keep prospective clients posted on available translations, Consultants Bureau publishes "Soviet Science and Technology," a $25/year monthly listing of all journals being translated in full plus a translated table of contents for each.

There are other lists, of course, containing titles of translated articles. Special Libraries Assn.'s John Crerar Library (Chicago) — a nonprofit repository of English translations of technical publications from many nations — offers "Translation Monthly" at $5/year. And next month, Dept. of Commerce's Office of Technical Services will use a $500,000 grant to set up the first clearing house for material translated for government use. Industry will be offered subscriptions to abstracts of 141 translated Russian journals, about 20 of which are in the chemical field.

Until now, a large number of translations prepared by government agencies have been immediately classified to keep outsiders from knowing what subjects are getting attention. These restrictions may be loosened. Abstracts will cost 50¢ each.

Custom Service: Translations of individual articles are available from many more sources than cover-to-cover journal translations. But they're expensive and require the work of scientific specialists if they're to be done accurately. Both Consultants Bureau and Pergamon depend almost entirely on specialists, working part-time, to translate articles in particular fields.

Coleman recently started Consultants Custom Translations Inc. to do special-order work. Translation fees run about $20/1,000 words of English text. But this varies with the subject matter and the deadline required. This cost isn't likely to drop soon, because of the scarcity of top-notch Russian translators.

Most U. S. companies don't have a systematic approach to filling their translation needs, generally leave this to individual researchers who may either have the necessary language proficiency or can arrange for translations.

Other firms employ one or more translators on a permanent basis, send out some of the work. American Cyanamid's Lederle Laboratories Division (Pearl River, N. Y.) has hit on a novel compromise. Some of its employees have formed a group and hired an expert in Russian to teach them scientific Russian. Individual expense for last spring's course was nominal, the firm says. Lederle supplied facilities for the group to meet, duplicating equipment, and the like. Students paid for dictionaries, reading material. (Good texts for this purpose are unavailable.) The first group met 20 times and, pleased with its results, plans another 20 advanced sessions in the fall. Another "basic" group is also planned for the fall. About 60 sessions will be needed to enable re-

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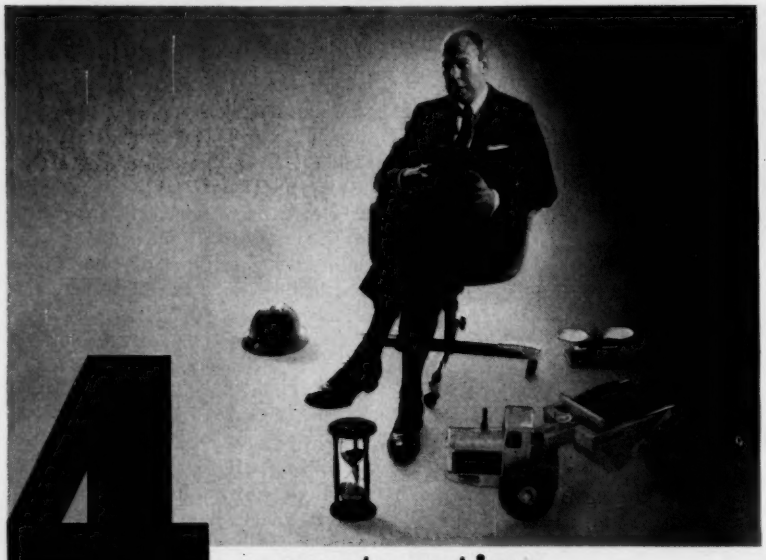

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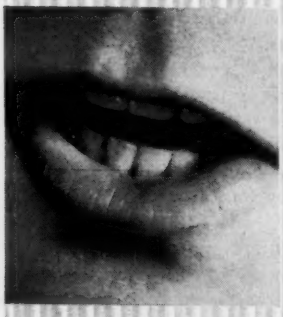

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RESEARCH

searchers to make good-quality translations. Lederle hasn't indicated it will extend its aid beyond the present level. But it might, if the results warrant.

Other Problems: Herman Skolnick, chief of Hercules Powder Co.'s technical information center (*CW, May 18, '57, p. 78*), feels that too much emphasis has been placed on Russian and that good material in Italian, Japanese and Finnish is being neglected. He and other translation specialists are looking for ways to keep translations up to date. Many of the journals translated today reach U. S. researchers' hands a year or more after their Russian counterparts read them. This discourages subscribers, raising the cost of each journal (which further discourages subscribers). Government subsidy of subscriptions may be one answer. Another may be industrial subsidies of cover-to-cover translations.

Company secrecy may cause duplication of translation work, not only within the industry but also within individual firms. Greater use of translation lists such as those of the Crerar Library and OTS could help cut this costly repetitive work.

But the biggest problem is the acute shortage of qualified translators. Often, these men are not well-versed in English or the subtleties of Russian, turn in translations that require additional editing. Frequently, professional translators, although proficient in both Russian and English, have difficulty with scientific material.

None of these problems appears insurmountable—their solution means rewards for all.

APPARATUS

Caking Cup: A 7-lb. Arbor Press used for determining the caking characteristics of powdered materials is available from W. C. Dillon & Co. (Van Nuys, Calif.). A material to be tested is placed in a cup, rammed under pressure to produce a pellet, which is then placed under pressure until it crumbles. Pellet size and shape may be varied.

•

Scintillation Analyzer: Baird-Atomic Inc.'s (Cambridge, Mass.) Integral Beta-Gamma Scintillation Analyzer is reportedly the first instrument that will allow for the counting

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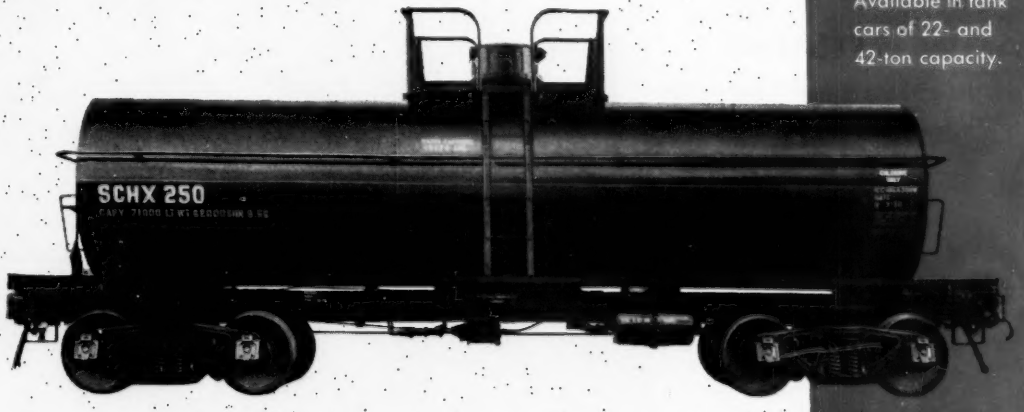

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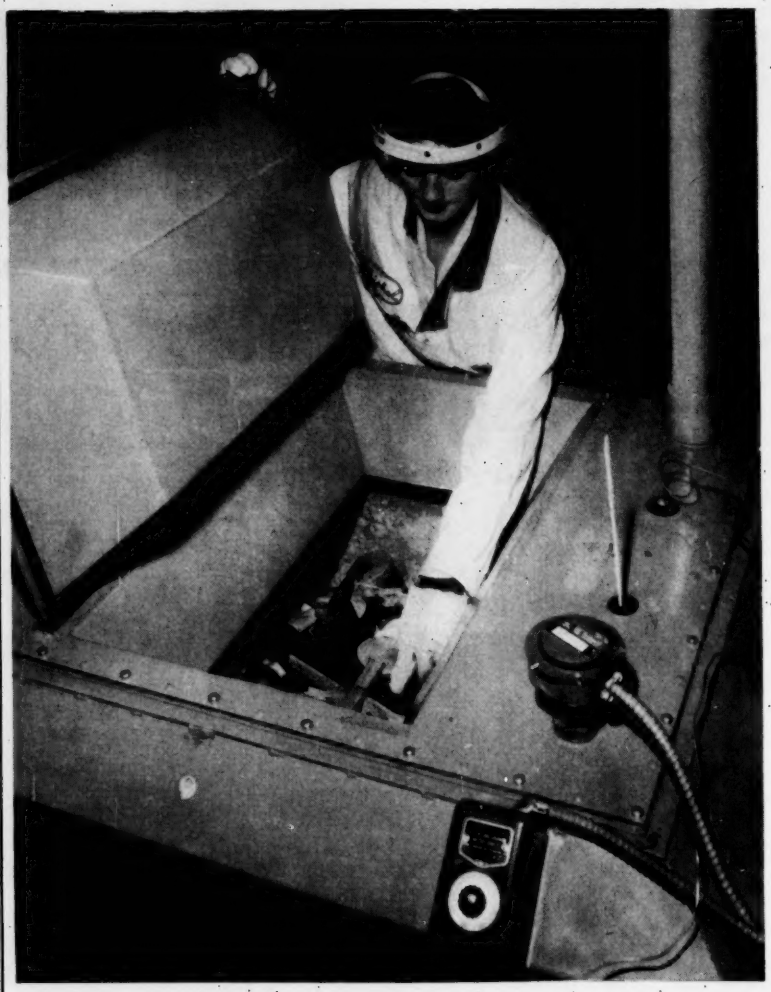
Odor-Meter: An odor-measuring instrument has been developed by Hemeon Associates (Pittsburgh). The device mixes odor-laden air with purified air, feeds the mixture into helmets worn by human beings. Their votes on the odor intensity, in combination with data the odor-meter provides, are translated into number quantities that describe the concentration of odor.

•

Film Adherence Tester: Eastman Kodak (Rochester, N.Y.) has developed a method of measuring wet adherence and abrasion-resistance of coatings. The equipment used is a pebble mill, charged with pebbles, fine quartz abrasive and water. Samples abraded for a specified time under standard conditions are placed in an



New Case for Bottle Polymerization

Up to 32 experimental monomer formulas can be simultaneously polymerized in this new bottle bath developed by Hunter-Bristol Division of Thiokol Chemical Corp. (Trenton, N.J.). The bath features urethane foam insulation. It is designed to minimize vibration and has a new closure that, Hunter-Bristol claims, permits swift, safe removal of bottles.

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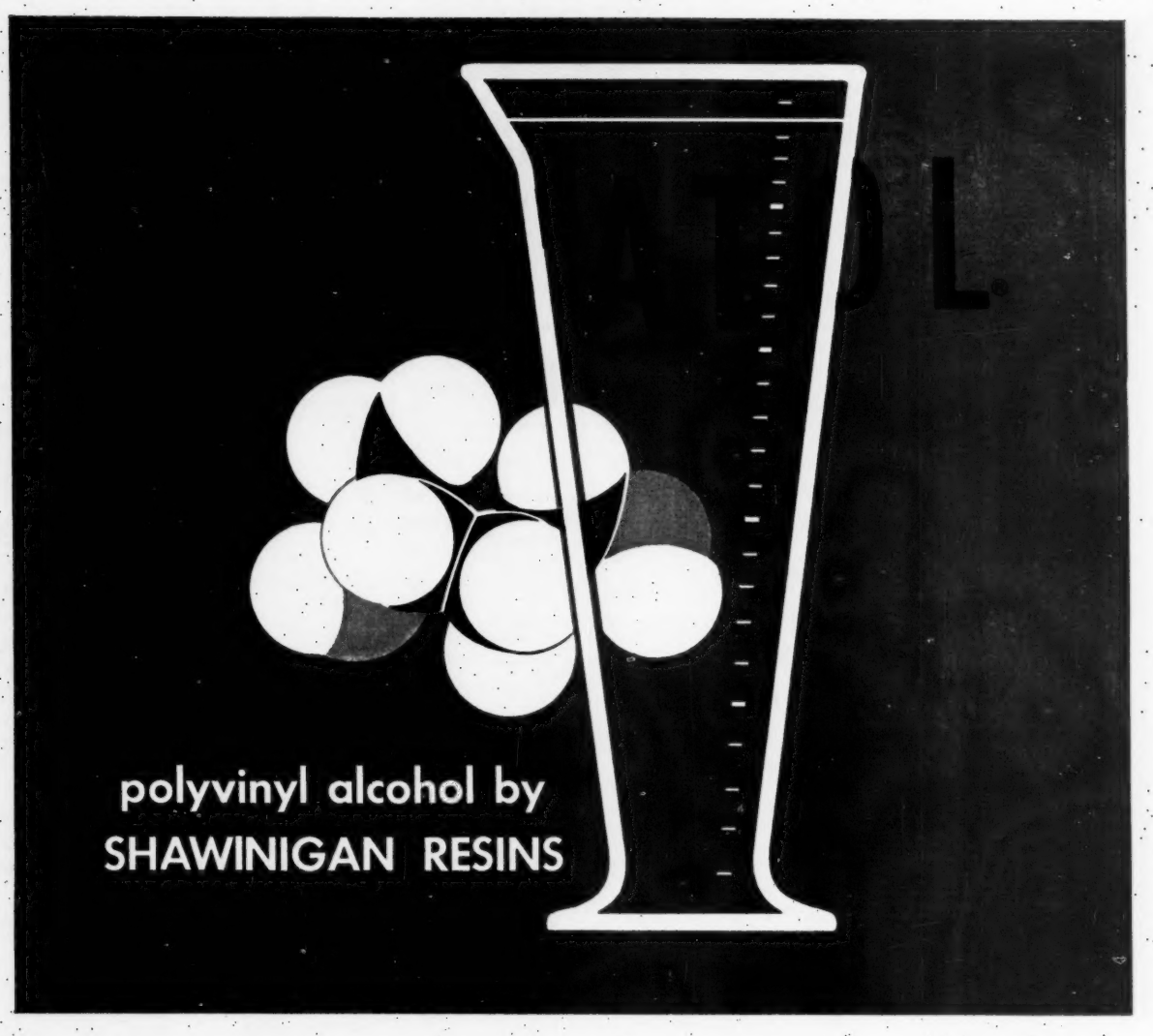

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RESEARCH

optical densitometer to determine the percentage of coating removed. Kodak reports its use with photographic films and papers and claims that it may be valuable for testing paints, organic coatings, plastics and textiles.

•

'Exotic Fuels' Filter: Hydrogen peroxide, hydrazine, ethylene oxide, liquid oxygen and other "exotic fuels" reportedly may be filtered with Pall Corp.'s (Glen Cove, N. Y.) new filter. It uses metallic filter media selected for corrosion resistance. Pall has equipment that will handle as high as 5,000 gpm. of liquid oxygen.

EXPANSION

• Ceramic-Metal Assemblies Corp. (Pittsburgh), a new firm, is engaged in the development, production of ceramic-metal assemblies. The company will handle ceramic-type materials including glass, steatite, porcelain and alumina. The metals: nickel, copper, molybdenum, stainless steel and their alloys.

• American Cyanamid Co.'s (New York) rubber research section has been moved from Stamford, Conn., to Bound Brook, N.J.

PROJECTS

• Notation systems for converting structural formulas into useful codes will be studied under a new National Science Foundation grant to Western Reserve University. National Research Council will direct and aid the project.

Interested chemists are invited to complete an NRC opinion questionnaire on the major areas of usefulness of notation systems; they should write their suggestions to J. S. Maclennan, Research Division, American Cyanamid Co., Bound Brook, N.J.

• "A Study of Graded Cermet Components for High-Temperature Turbine Applications" (PB 131434, $1.25) reports on a study of an Iconel-X and titanium carbide alloy coating for root and airfoil tip sections of jet aircraft turbines. Coating was designed to improve ductility, toughness and resistance to thermal shock.

The report is now available from the Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.

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P-8572 Chemical Week
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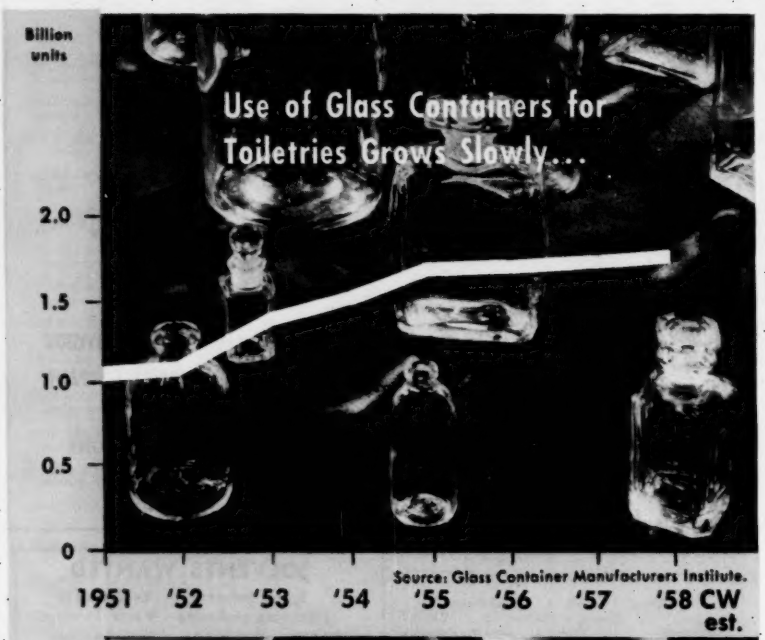
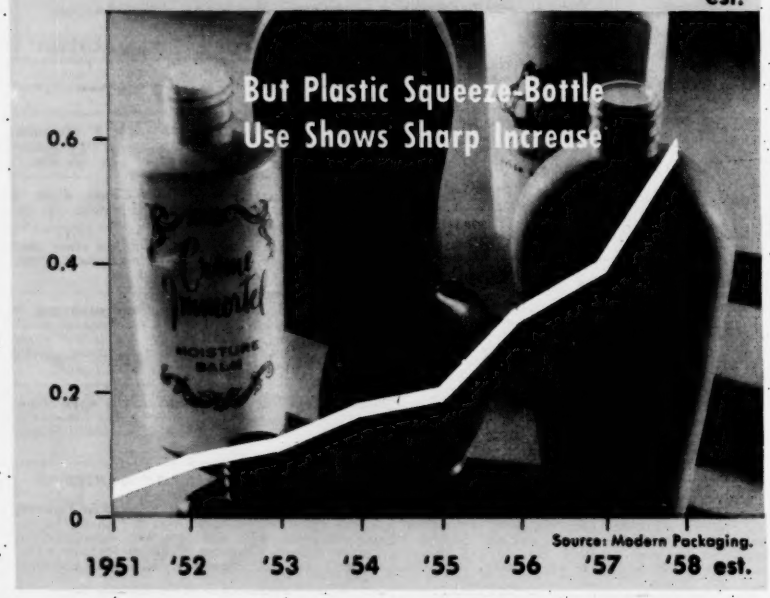
Plastic Gains Faster in Container Boom





Production of containers—both glass and plastic—for cosmetics and toiletries will hit a new high this year, some 2.65 billion units, compared with last year's 2.40-billion-unit production.

Output of glass containers for these uses will likely reach another all-time high, about 1.85 billion units. Although that's only a slight gain over '57's 1.80 billion, it's an encouraging 68% gain over the 1.1 billion units used for these two products in '51.

But growth in demand for plastic squeeze bottles will hit some 0.6 billion units, and that's a 50% consumption jump in just one year. It's a 12,000-fold increase since '51, when 50,000 units were used.

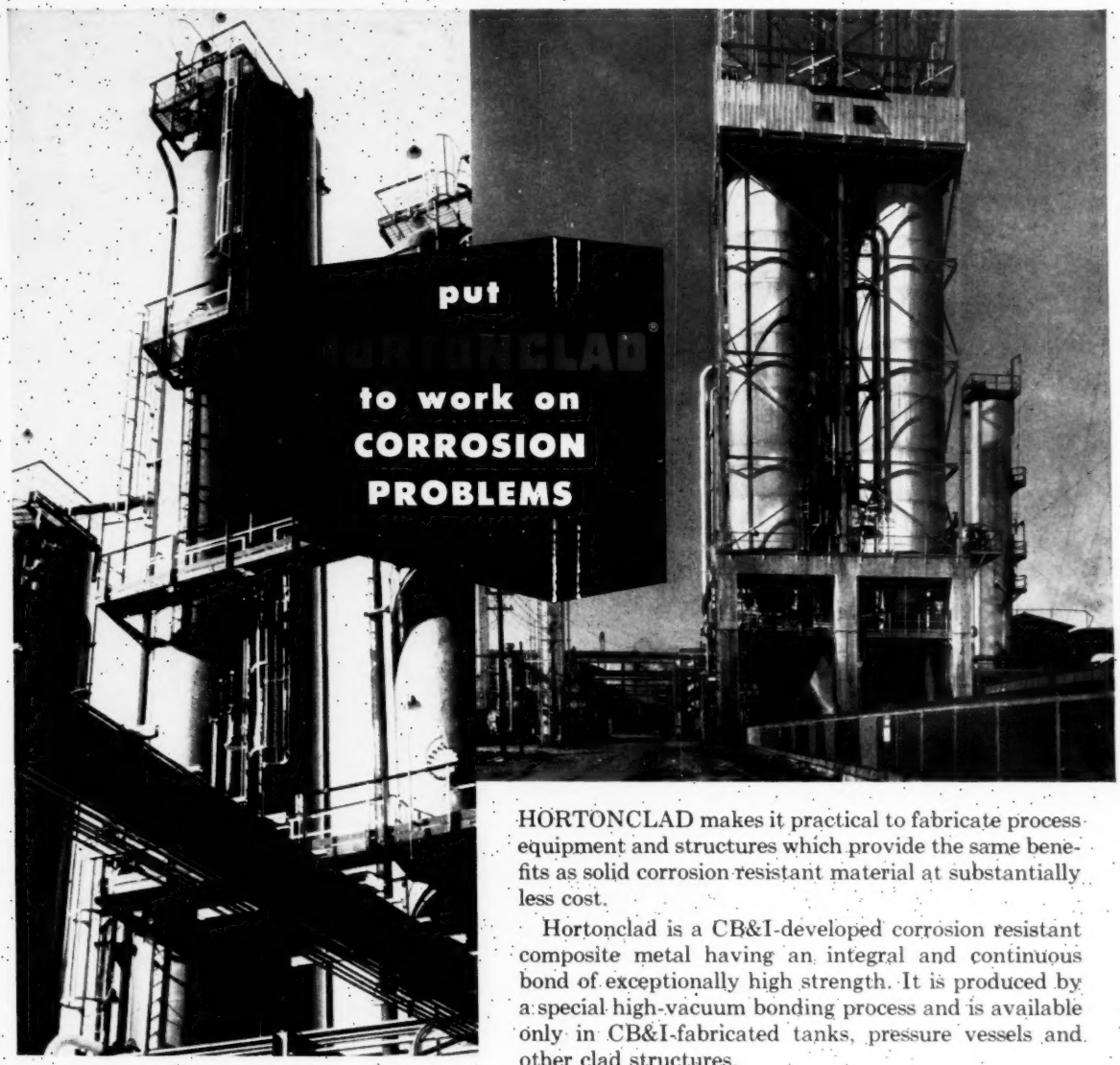
Cheered by this heady growth trend, the plastic bottle industry expects '60 sales of 1.5 billion units, mostly for cosmetics packaging.

Main factors behind surging demand for plastic squeeze bottles:

- They are break-resistant, lightweight.
- A variety of products may now be packed in them—due to such improvements as special linings.
- Plastics prices—hence cost of bottles—are dropping.

Glass Bottle Makers Confident: In spite of the inroads made by plastic containers, producers of glass bottles believe their products will continue to be the leading receptacles for toiletries and cosmetics, although use of glass bottles by the cosmetics industry represents less than 10% of total use of glass containers. Big reason for this confidence is, of course, that a greater range of products may be packed in glass units.

Total glass container output, growing steadily *(CW, Aug. 2, p. 60)*, passed the 20-billion-unit mark in '57.



(Above)

ABSORBER TOWER at a Louisiana chemical company has stainless steel Hortonclad shell. Thickness of backing and cladding is 1¼ inches.

(Right above)

COKING CHAMBER at a Kansas refinery uses 405 stainless steel Hortonclad backed by A 205 Grade A moly steel.

HORTONCLAD makes it practical to fabricate process equipment and structures which provide the same benefits as solid corrosion resistant material at substantially less cost.

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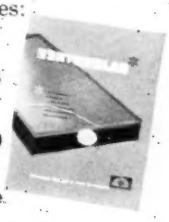

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